PARENT-CHILD AFFECTUAL BEHAVIOUR: HOW MOMENTS OF MEETING CAN INDEX CHANGE FOR DYADS WHERE THE CHILD HAS AN AUTISTIC SPECTRUM DISORDER.

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Averil Ann Worner

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Abstract

A single-case study design was used to explore the interactive patterns of six mother-child (with an ASD) dyads and to evaluate the utility of an affective measure of relationship change. Retrospective video analysis of Dyadic Interactive Therapy (Champion Centre, Christchurch, New Zealand) were coded using operational definitions of "Moments of Meeting" and "Moving Along Moments" coupled with behavioural indexes of change.

Results found that the mean number of both types of moment increased significantly with time in therapy. This was offset by a corresponding significant increase in the divergence of "Moments of Meeting" relative to "Moving Along Moments" across sessions as indicated by the mean length of time (measured in frames) spent in engagement in both types of moment. An increased number of behaviours accompanying these moments were recorded in later sessions for all dyads.

Results are interpreted as improvements in the interactive patterns of dyads over time and suggest that "Moments of Meeting" are sensitive to the intimate exchanges of two persons. Clustering of both types of moments are interpreted as evidence for the regulatory capacities of the dyad and the individuals within.

Discussion follows linking the concepts of scaffolding and co-regulated experiences to biology, unique qualities of dyadic interactions, and an emerging temporal property to these exchanges as measured by seconds and micro-seconds.

The implications for future research and appropriate methodology to explore interactions in real time is indicated.

Only in relationship can you know yourself, not in abstraction and certainly not in isolation.

J. Krishnamurti

INTRODUCTION

From the earliest moments of life, humans seek intimate and meaningful connections with each other. How these moments are sustained and supported has been the subject of much debate and scholarship. Yet what have we learned about an infant's and young child's preparedness to enter the world of another and become a willing participant in increasingly complex interactive exchanges?

In the pursuit of answers to this question, the reader enters a complex web of interwoven themes encapsulating phylogenetic and ontogentic principles and the consequences for change across the lifespan. Early social-emotional, interactive and affective development, become the threads of this change which when unravelled and examined give insight into the colour and vitality of human interactive experience. A body of literature reflecting these assertions has proliferated over the last four decades and critically impacts on current research.

Theoretical considerations

Significant changes in the last forty years in both theoretical models and multidisciplinary sources of relevant information have shaped current views of the ontogeny of early social experiences. One feature of this change is clear shifts in theoretical orientation and application. Parke (1992), in a recent review highlights the shifts from macro-theoretical positions (Piaget, 1954; Mahler, Pine & Bergaman, 1975; Bandura & Walters, 1963; Bowlby, 1969), to "domain specific minitheories" (pp 16), (Ainsworth, 1973; Izard & Malatesta, 1987; Lewis & Michalson, 1983; Tronick, 1989; as crucial features of this change. Current perspectives and research in infant and early childhood development reflecting a life-span view of development (Baltes, 1987), suggest the narrower frames of

reference offered by the plethora of *minitheories* does not sufficiently account for the dynamic processes at work in the early development period. It has been suggested that an "appropriate model presumes a unity of developmental processes, both biological and behavioural, that is characterised by a dynamic relationship between the individual and an individual's contexts" (Sameroff, 1993, pp3). A unique neurobiological profile for the individual is the outcome of this relationship (Schore, 1996). Within a systems perspective these notions and those of others (Thelen, 1989; Fogel, 1992a; Sameroff & Feise, 1990), are shaping contemporary thought regarding the analogous and mutually influential growth of social, intellectual, physical, and emotional capacities of individuals. Thus it is the interface between individuals and contexts along constantly moving axes of experience, that furbish and shape developmental growth.

The literature now demands greater attention to interdisciplinary treatment of subject matter to attempt to capture something of the "embeddedness but also the multiple sources of regulations that affect the developmental process" (Sameroff, 1993, pp12). Thus developmental psychology has begun to weave themes from ethology (Bowlby, 1969), ecology (Bronfenbrenner, 1979; Bronfenbrenner & Ceci, 1994), neurobiology, (Perry, Pollard, Blakely, Baker, & Vigilante, 1995), psychobiology, (Schore, 1996), and psychoanalysis, (Beebe, Lachmann, & Jaffe, 1997). Through a blend of these and others, an organismic view of social-emotional development in infancy and early childhood emerges and predominates.

This brief precis of theoretical treatments of early development places the present study in an appropriate historical context. Yet what parts of these theoretical models and research encourage an understanding of the complexities surrounding human socio-affective exchanges? What emerge as critical markers and significant trends that enable us to evaluate social emotional development in very young children? What might this information lend to our understanding of populations whose development does not evidence expected patterns of change? These questions imply answers to not only the "what" of human experience but also the "how". These questions also invite discussion of the elements of human discovery that expand our consciousness and ability to enter into and share the life and world of another.

In turning to the literature the reader encounters particular strands of research that not only reflect the theoretical foundations upon which they rest, but give clear passage to these concerns. These include emotional development, face-to-face interactions and parent-child affectual behaviour, and the nature of primary interactive relationships.

Emotions in Development.

The literature on emotional development in infancy and early childhood, provides the window through which we may glimpse the impact of emotional experiences, and the contexts in which they occur. Interest in emotions and their development has burgeoned in the last forty years. Emotions were historically used to index "perceptual and cognitive processes" (Campos, Barrett, Lamb, Goldsmith & Stenberg, 1983), and as such were regarded as private and restricted to internal states of consciousness. Growth in theory and research in the literature of emotional development in early childhood, act as critical markers of the importance the role of emotions have assumed in evaluating the nature of this development.

As a result of these dramatic shifts theories regarding emotional and social emotional development have emerged with related themes yet with variations among models as each seeks to explain change and growth in infant abilities. Whilst it is not possible in the context of this thesis to give a complete account of the shifts in theoretical and research paradigms, a number will be highlighted to illustrate the above points.

Widespread acceptance of Piaget's theory and Bowlby's (1969), Attachment Theory, thrust emotions neatly into a socio-affective context. Attachment Theory remains influential in contemporary explanations of emotional development, with the quality of the caregiver-child relationship assuming centre stage (Lundy, Field & Pickens, 1996; Kogan & Carter, 1996). Central to the theory (and subsequent reviews, 1973, 1980), is the notion that infants and their primary caregivers are biologically predisposed to attach to one another. Support for this tenet has emerged and indicates that internal biological hierachies underpin all social-emotional organisational abilities (Ryan, Kuhl & Deci, 1997). Nonetheless Attachment Theory provides an instructive framework upon which researchers can hang critical features of caregiver-infant relationships. Indeed how early caregiving experiences influence subsequent development is linked to patterns of attachment. Largely mobilised by the separations and reunions of the Strange Situation (Ainsworth, Blehar, Waters & Wall, 1978), the paradigm consistently associates emotional factors with attachment classifications (Braungart & Stifter, 1991; Shiller, Izard, & Hembree, 1986). More importantly it has been possible to highlight maternal and infant variables that contribute to insecure attachment such as maternal sensitivity (Isabella & Belsky, 1991), maternal depression (Murray, 1992), infant temperament (Crockenberg & Smith, 1982), and low birth weight (Spiker, Ferguson & Brooks-Gunn, 1993). Research seeking to elucidate

factors that contribute to healthy secure attachment patterns continue to focus on the caregivers resources to respond to, and nurture the infant when the infant signals distress and/or need (Zeanah, Mammen & Lieberman, 1993).

Analogous to this is the term introduced by Bruner, (1975) to describe the support an adult is able to provide to a child to successfully negotiate a task. "Scaffolding" is held to be a process of recognition and action as the adult comprehends the needs of the child, and acts to support developmental change and feelings of effectance on the part of the child. It embraces notions of well-being on the part of the child, which are a direct result of the adult's response and structuring of the environment.

In the same decade as Bowlby's early writings, the perennial work of Silvan Tomkins (1963), paved the way for not only research examining the role facial expressions play in the signaling and communicative functions of emotions, (Ekman & Friesen, 1971; Izard, 1971), but also theoretical models regarding the socialisation of emotions. Through the empirical endeavours of Ekman and Izard, the search for the interpretation of human affectual states ignited the ensuing cross-cultural research, suggesting the facial expressions may well be in part determined by genetically coded programmes, (Izard, 1977, Ekman, 1992). Both argue for the universality of emotions such as anger, disgust, fear, sadness, interest and joy. The view that discrete emotions are present at birth and that facial expressions are "read-outs" of infant emotion, forms the cornerstone of Differential Emotions Theory, (Izard, 1971, 1977, 1991). Here it is suggested that emotions form a motivational system that is separate from, yet intimately related to, other systems such as cognition and perception. Further support for this view is the finding that during the second and third years, "pride, shame, guilt, jealousy and embarrassment" (Dunn, 1994, pp 353), emerge and draws the readers attention to role cognition plays in their development. This is further evidence for the ontogeny of emotions.

An alternative yet complementary view using dynamical system model has continued to be espoused by Camras (1992), and postulates that facial expressions instead of being "automatic readouts" (pp280) are brought on-line with other systems in a context specific way. Nonetheless within this frame of reference facial expressions are retained as emotional signals.

In a further development of the theory, (Izard & Maletesta, 1987), this tenet is formally expounded, and it embraces the notion that emotions serve as the primary agents of change in development across the lifespan. Maturation including growth in cognitive functioning is critical here. Indeed for Izard, by combining social cognitive and biological information

speculates that the "first affective-cognitive structures is the associative bond of enjoyment and the mothers face" (Izard, 1994, pp360).

This notion is echoed eloquently in Greenspan's postulate – dual code (Greenspan, 1997, pp21). Here it is suggested that "human beings couple phenomena and feelings from the very beginning of life" (1997, pp18), and that sensory experiences are coded in dual fashion – by their "physical qualities" and the "emotional qualities" attached to them (1997, pp21). As these dual codings are stored, according to Greenspan, the mind is literally grown. It is the emotions that give the experience meaning and it is they that form the "Architecture of the Mind" (Greenspan, 1997, pp13). Resultant behaviour then stems and is marshalled by an infinite number of variations of emotional experience.

Malatesta's (now Magai), own views have shifted somewhat recently and these shifts are relevant to the questions posed earlier. Magai and Hunziker (1993), argue from a discrete emotions viewpoint that the adaptive functions of the primary emotions serve to mould the development of the self and cannot be separated from the intimate contexts in which they occur. These authors cleverly bind social, cognitive, attachment and psychoanalytical principles into a theory of personality – predicated on the notion that emotions provide the motivational drive in personality development. Quality of early socio-affective exchanges, communication of emotional intent and meaning within relationship, and moments of crisis and change become the vehicles for the journey into development of the self and the self in relationship with others. This functionalist perspective succinctly outlines how differentiated emotions from birth mobilise emotional experience between caregiver and child. All the attendant issues around attachment become crucial here.

Lewis (Lewis, 1992; 1993; Lewis & Michalson, 1983), whilst rejecting the view that some emotional states are components of a genetically pre-wired system, also embraces the significance of the socialisation of emotions. He holds that it is the social environment that provides the platform from which a gradual differentiation of emotions can springboard, and has suggested that "the organising principle of knowledge of the self is necessary for the experiencing of emotions", (Lewis & Brooks, 1978). Cognition remains central to this tenet with enhanced self-awareness a product of socialisation, maturation and biological propensities. More specifically, the theory separates emotion into "emotional expressions, emotional states and emotional experiences" (Lewis & Michalson, 1983), and further suggests that the integration of the three, or the meaning or emotional experiences of infants and children are developed through understanding their, as well as other behaviour in context" (Lewis & Sullivan, 1996, p43).

It is not difficult to see that Lewis carves a more cognitive route to the understanding of emotional development than Izard and Magai where emotions are central to their theses. The perennial dichotomy between emotion and cognition is obvious when comparing these views.

Through all of this, a view of emotions as organisers and information carriers emerges, and it is these processes that are said to underscore the course of emotional development (Izard, 1994).

In addition how emotions function to regulate social emotional development seems equivocal. Campos' relational view of emotions also has a clear emphasis hinging on interpersonal and intrapersonal factors. More specifically this strengthens the relationship between emotion and goal relevance, how emotions are communicated between people and hedonic tone. Campos and colleagues have stated that emotions are *"processes of establishing, maintaining, or disrupting the relationship between the person and the internal world or external environment when such relationships are significant to the individual"* (Campos, Campos & Barrett, 1989, pp 395, italics theirs).

Clearly under these conditions, emotions cannot remain as internal, individual experiences but rather are active in significant events that are interactive, contextually bound and dynamic.

In answer to the question "What develops in emotional development?" Izard (1994), succinctly suggests that the one of the primary matters of import is "establishing coherent and cohesive patterns of emotion, cognition and action" (pp361). In answer to the same question Dunn (1994), outlines how a focus on children's emotions in the contexts of their close relationships, invites insight into a complex range of topics including, eliciting features of the environment, strength of intimate interactions, cultural embeddedness and an understanding of other, world and self.

Reflecting the trend of theory and research outlined earlier, the tenets held by authors mentioned in this section encourage no less than an eclectic approach to the topic, drawing on many sources of information for support. To focus attention on emotion expression (Ekman, 1992), emotion regulation (Campos et al, 1989), cognition (Lewis, 1993), and cultural factors (Dunn, 1994), in infancy and early childhood is to explore the foundations upon which lifelong emotional development rests.

Enmeshed in the various positions offered are critical commonalities that mobilise matters of import to research models. The socialisation of early emotional development within the confines of attachment relationships and the daily social-affective exchanges between

caregiver and child suggest that emotional development can only be viewed within these contexts. It is to these contexts that the discussion now turns.

The contexts of the caregiver and child

Research on caregiver-infant relationships raises epistemological concerns regarding the very nature of human social activity. In a well-written account of the origins of social understanding (Hobson, 1993), suggests that in order to attain knowledge of objects, there must first be knowledge and experience of the relations that exist (or not), between objects. It is further held that this is true for both inanimate objects and people. The natural extension of this assertion is to question the origins of these relations perspectives. With regard to people, this naturally extends to the conditions that enable an awareness of "personhood" in relation to another.

These conditions do not imply that an individual can gain an understanding of a person in isolation from them. Rather it is through reciprocal experiences with them that this understanding can develop – socio-affective exchanges become the vehicles for this growth. Within these experiences, it is suggested that an individual *feels* what it is to be in relation to another and the significance of coordinated "emotional contact" is maintained (Hobson, 1993, pp229).

The earliest exchanges between infant and primary caregiver provide not only the appropriate context but also the potentially appropriate conditions in which these coordinated experiences can have their genesis.

A significant number of commentators have characterised this fact, to create a rich texture of related themes and principles which now guide research.

One obvious and enduring product of this enquiry (as has been discussed), was the propounding of the propensities of infants and their caregivers to attach (Bowlby, 1969). Despite the fact that Bowlby paid little attention to the regulatory forces at work within these relationships, it is important to remember that Bowlby gave import to the behavioural repertoires of infants (eg. crying, sucking, smiling), and to the parent's ability to be responsiveness to these bids. Primary interactions and reciprocal patterns of sharing become concurrently based on experience and behavioural responses (Hobson, 1993).

In a related vein Sameroff and Chandler (1975), stressed the importance of the continuity of interactions and how the outcomes of relationships are reflected in the constantly changing dynamics expressed in these interactions. This transactional view of relationship is revolutionary in describing adaptation to "disturbance" (Sameroff, 1993, pp12) as having

roots in active contexts. An emphasis is placed on the historical nature of experience and the significance of how the "past and present" can impact on "future" interactions (Sameroff, 1993, pp9). Through this it is possible to conceive of processes that reflect interdependence between child and environment. The interactive responses of the child are both influenced by, and influential of, the social contexts/environments in which they are displayed.

These theses are neatly mirrored in Trevarthen's notion of "primary intersubjectivity" (Trevarthen, 1980). Here it is held that the early months of a child's life are crucial for building a history of repeated patterns of emotional connectedness to others, through their innate abilities to interpret the emotional content of the affective displays of their primary caregiver(s). Inherent in this is the view that it is the emotional information contained in these affective expressions that acts as the motivator for enhanced meaningful communications with others.

Similarly Tronick, holds to the primacy of early social skills as functional adaptations of communicative capacities. In his terms (which will be returned to later), "coordinated regulation of joint activity" (1998, pp146), is a hallmark of mother-infant synchrony. Under ideal conditions, the pair are able to negotiate communicative opportunities mutually. In a later publication Tronick (1998), draws the readers attention to the array of terms used in the literature to describe synchrony. These include affective attunement (Stern, 1985), intersubjectivity (Trevarthen, 1980), mutual regulation (Tronick, 1989), and mutually adaptive dance between partners (Barnard & Kelly, 1990), and affective intersubjectivity (Mundy, Kasari & Sigman, (1992). Whatever the syntactic envelope used, all terms try to capture something of forces at work when a small child and their primary caregiver engage in communicative acts.

Stern has continued to influence the literature concerning parent-child relationships by constantly stressing and upholding the significance of the overt behaviours being windows to the internal state of the partner reflecting internal representations and subjective experiences. Stern makes it clear that parents have a much greater history of "interactive traffic" (Stern, 1995, pp59), through which they are able to mediate and regulate the world for their child. For Stern the interactions between the infant and the parent form the lens of the clinical microscope through which can be seen how the parents subjective world (including hopes, dreams and desires for the child), can come to bear on the child's growing capacity to achieve emotional connectedness to them. Similarly the reciprocal influence of the infants growing "internal working models" (Bowlby, 1969), on the parents

is to be appreciated. Implied in this is the transfer of implicit knowledge, which Stern suggests cannot be understood until the prior condition of understanding the structure and content of the interactions themselves is appreciated. This point will be returned to in a later discussion.

In a recent publication Rochat & Striano (1999b), suggest that intimate parent-child interactions are the "cradle of social understanding" (pp3). They support Trevarthen's view that intersubjectivity of that "sense of shared emotional experience" (pp5) is a direct product of reciprocal engagements. They espouse clear definitive boundaries between emotion, affects and feelings embedded in the private experiences of the child and suggest that this is resonated with the primary caretaker.

At this point it is important to note that the discussion thus far has made no reference to the *types* of communicative acts that ensue from early interactions. This is partly due to space, but largely because the positions outlined embrace all features of intimate exchanges, including positive and negative experiences as having critical effects on infant mental health and on dyadic functioning. Importantly, answers must be sought to *how* they are negotiated and regulated, and ultimately expressed within the context of the primary relationship.

Tronicks Mutual Regulation Model (MRM, 1989), serves this discussion well. The infant's and caregiver's roles that constantly change from initiator to regulator during social interactions is at the core of the issues the model claims to explain. Deployment of emotional signals, is seen as attempts to control the social environment with the distinction between success and failure for the infant modified by parental sensitivity and responsiveness, with historical and social influences acting largely for the parent. The terms, "interactive error" and "interactive repair" are almost synonymous with those of separation and reunion in Attachment Theory, and the links with the theories outlined earlier become salient. It is largely through the "Still-Face Paradigm (Tronick, Als, Adamson, Wise & Brazelton, 1978), that these notions are mobilised. Tronick lays claim to the bidirectionality of the child-adult emotional communication system, suggesting that qualitative outcomes of positive mutual experiences can be characterised as being "reciprocal, synchronous and coherent" (Tronick, 1989, pp115).

Following similar lines Beebe and colleagues (1997), advance two principle organisers of interactive experience. It is suggested that each covers particular aspects of the interactive spectrum and both are directly related to goals of the dyadic system. The principles of "Ongoing Regulations" and "Disruption and Repair", suggests coordinated interactions are

sustainable, and a threshold of disruptive experience is "reparable" (pp163). This transformational perspective speaks of the continuous and concurrent nature of interactive experience.

It is important to acknowledge that the literature outlined this far has focussed on dyadic interactions. Triadic and wider socio-cultural influences on infant mental health are both acknowledged and appreciated for their ability to enrich the developmental literature and advance the complexity and multiplicity of interactive contexts in which infants and young children find themselves. Although outside the context of the present study, it is within these contexts that primary dyads are situated and as such must remain as key determinants of all social behaviour.

With this in mind, it is important to uphold that in the search for the origins of social affectiveness, theories have allowed the explication of a myriad of themes that all point to the significance of early intimate exchanges. In addition to explaining and describing principles that guide their tenets, is a juxtaposition of new empirical endeavours to mobilise them.

Two important areas of research relevant to the present study – Face-to-face encounters between parent and child, and Social Referencing - are excellent examples of process based empiricism examining the intricacies and inner workings of interactive experiences. Not only do they herald the reconceptualisation of mutual regulatory forces within intimate relationships but also attest to the inexplicable links between emotions and early child development. A brief treatise on each is necessary.

Facial Expressions and Affectual Communicaton.

Extensive data examining infant-mother face-to-face interactions suggests that from within the intimacy of these relationships, lie woven patterns of regulated emotional expressivity and modified response repertoires (Brazelton & Yogman, 1986; Stern, 1985; Stern, 1995; Walden & Ogan, 1988). As infants grow they develop the ability to search for meaning in another's emotional expressions which provide clear information as to their place in interactions, and to disambiguate events that are unfamiliar and require confirming information (Cassidy, 1989). The study of early mutual play behaviours in dyads, suggests that infants are able to construct meaning from the world through interaction with various expressive displays (Lyons-Ruth & Zeanah, 1993).

Infants are said to produce all movements in their facial musculature said to be necessary for recognition of basic emotional facial responses (Oster & Ekman, 1977). In addition

sadness, anger, disgust, interest and joy can be identified from infants facial displays between 1 and 9 months (Izard, Fantauzzo, Castle, Haynes, Rayias & Putnam, 1995). That infants are able to derive specific meaning from particular facial expression at around 6 months (Stenberg, Campos & Emde, 1983), and demonstrate ambivalence to another's conflicting emotional signals at 10 months (Caplovitz-Barrett, Campos & Emde, 1996), is further evidence that from an early age infants are able to connect facial displays with environmental contexts that influence behaviour.

It has also been found that mothers respond differentially to negative and positive expression in their offspring (Huebner & Izard, 1988), that infants of depressed mothers display "depressed-like" facial expressions (Lundy, Field and Pickens, 1996), that young infants change their behaviour in response to their "emotionally disconnected" mother during the Still-Face paradigm (Kogan & Carter, 1996), and that infants use the facial expressions of their mothers to negotiate the "visual cliff" exercise (Sorce, Emde, Campos & Klinnert, 1985).

Perhaps one of the most significant events in this literature was the development of the Still-Face paradigm (Tronick et al, 1978). This was designed to examine the effects on the infant of "controlled disruption" of regulated patterns of engagement. The mother, on instruction, is asked to look at the infant impassively and remain non-responsive. Widespread use of this model has produced robust findings for infant behaviour. Faced with an "expressionless" mother infants typically become less attentive, and displaying reduced positive expressions over time (Isabella & Belsky, 1991; Malatesta, Culver, Tesman & Shephard, 1989; Murray & Trevarthen, 1985). In addition to this the paradigm has been associated with biological correlates of depression (Field, 1984), stable coping style and subsequent attachment classification (Cohn, Campbell & Ross, 1992), and cyclical patterns of effort on the part of the infant to reengage the mother (Murray, 1991).

These citings are but a glimpse at the available literature but have been pursued to highlight the fact that infants and young children use and express facial displays to regulate their own and other's behaviour. Tronicks own views on the outcomes of the Still-Face procedure have changed since the inception of the paradigm. Recently (1998), he has suggested that there is something more to the infant's bids to retain emotional attention from the mother as first thought. Whilst retaining the mutual regulatory processes at work, he suggests that there is more than biological inheritance driving the infant's need to reconnect. He draws on systems theory to explain this "something more" (pp229). Before this is elaborated on

and connected to the present study, it is important to highlight one clear example of mutual regulation – social referencing.

Social Referencing – as an emotional regulator

Social referencing is a construct used to describe a specific form of regulation in infant-caregiver dyadic functioning. It is a process of emotional communication whereby a caregiver's interpretation of an event forms the basis for an infant's understanding of the event (Klinnert, Emde, Butterfield & Campos, 1986), or to disambiguate an event and change the action tendencies (Campos et al 1989). Inherent in this is the assertion that referent material must be clear and understood by both partners. This is also true for Tronick's assertion that parental and infant responsivity in affective communication is crucial for the development of reciprocity in personal interactions (Tronick, 1980).

Research has shown that particular infant behaviours elicit parent responses eg cry, smile, and act as communicative signals. Research suggests that recognition of infant cues is directly related to maternal responsiveness (Walden & Ogan, 1988), which is in turn related to subsequent attachment patterns (Goldberg, MacKay-Sokoia, & Rochester, 1994).

It is now well documented that the social referencing emerges in the second half of the first year of life (Feinman, 1982; Walden & Ogan, 1988; Lyons-Ruth & Zeanah, 1993; Walden & Knieps, 1996). This coincides with the infant's increased ability for joint attention (Bruner, 1981; Rochat & Striano, 1999b), and abilities to engage in triadic interactions involving objects and other people in significant events (Stern, 1995; Rochat & Striano, 1999b; and Adamson & Russell, 1999). This imperative marker of growing communicative skills is said to index a growing awareness of self, and self in relation to other (Bruner, 1975). Importantly it points to aspects of intentional communication and the ability of the infant to *initiate* interactions and *apprehend* the attentions of the caregiver (Mundy, Kasari & Sigman, 1992).

The "visual cliff" exercise (Sorce, Emde, Campos & Klinnert, 1985), is one of the best examples of how 1 year-old children intentionally use the affective information of their caregivers to negotiate their path along an unfamiliar transparent structure. They and others (Walden and Ogan, 1988), draw the conclusion that through the emotionally laden information contained on the mother's face and the concurrent signalling of the significance of the information, that the child's responses are altered.

Predicated on these notions is the fact that certain conditions must exist prior to the development of social referencing abilities. First of all there must be a significant history of regulated affectual experiences within the dyad for the child to recognise and use the signals of the caregiver. Clear reciprocal interactions have been shown to be precursors to the interpretation and perception of affective displays (Goldberg, 1977). Further to this, it is also held that the clarity of message contained in the expressions can directly effect the reciprocity of interactions each partner enjoys (Gianino & Tronick, 1988).

Again the reader is reminded of dyadic functioning and the contexts in which this occurs. In the case of social referencing this means that the interactions are mediated by attention to an external event. These interactions as before occur in real time and successful negotiation is associated with mutual and concurrent attention to the saliency of the situation.

The usefulness of these data to the present study is to highlight social referencing as not only an index of the maturing of interactive sequences between caregiver and child, but also as an index of the regulatory forces within the relationship. Signalling patterns must be coherent, joint attention to an external event must be achieved and the saliency and significance of the parent's *potential* response to the event in and of itself must be of crucial relevance to the child.

This latter point suggests that an underlying assumption within the behavioural paradigms adopted to measure and characterise social referencing, is implicit knowledge about how the *system* will organise the experience presented to them. This concept is captured fully and expounded in depth by the Dyadic Expansion of Consciousness Hypothesis (Tronick, 1998).

Dyadic Expansion of Consciousness Hypothesis

A critical tenet of a model of psychotherapeutic intervention (Process of Change Study Group Boston, 1998), is that the processes of change in adult psychotherapies is said to be mirrored in parent-child interactions.

Importantly it is further held that the inner workings of the one organised system (client-therapist), are reflected in the other (parent-child). This assertion not only resonates with a lifespan view of development – emotional shaping and reshaping marshal the same dynamic processes, but also that it suggests that within the earliest of all human interactions lie the keys to unlocking emotional development that becomes diverted from a healthy course.

Tronick's (1998), Dyadic Expansion of Consciousness Hypothesis eloquently embraces this notion suggesting micro-analytical interpretations of these communications serve to elucidate *how* shared states of consciousness are enacted dyadically. The hypothesis (and it is important for clarity to quote in full), reflects a further development of the Mutual Regulation Model, and states that "each individual is a self-organising system that creates his or her own states of consciousness, which can be expanded into more coherent and complex states in collaboration with another self-organising system" (pp290).

In his commentary Tronick outlines how his earlier views of a pre-existing propensity of humans to interact with others, has been modified by understanding the "complexity and coherence" of dyadic states (pp292).

Drawing on systems theory, Tronick compels the reader to examine the likely consequences of dyadically created exchanges. Central to Tronick's claims are the abilities of each interactant to correctly appraise the affective expressions of the other. In this way it is suggested that the meaning behind these displays is overtly and covertly attainable. Through this "mutual regulation of emotion" (295), the dyad arrives at "singular dyadic states of organization" (295). According to Tronick the quality of the information contained within these states is richer than that of one of the pair. He evokes the term "mutual mapping" to express the processes of change in the brain organization of each member.

Tronick like Stern (1995), contests that the history of dyadic interactions moves the exchanges beyond the apprehending the presenting information, to the processes through which they have moved to meet and be together. This journey from "I can", I see" and "I am", to "We can", "We see", "We are", represents for Tronick the "something more" of intimate therapeutic dialogue, places emotions at the heart of communication and offers answers to the question that opened this thesis.

Whilst this reads somewhat like a review, it is important to recognise that Tronicks postulates support the central theme of this thesis that emotions and emotional communication are at the core of one-to-one intimate experiences. In addition to this they speak of the continuity in affective exchanges (a transformational perspective), contexts in which they occur, the mobilisation of mutual experience in time, and the consequences for dyadic development. These guide the rationale behind the present study, and it is largely through Stern's conceptualisation of "moments of meeting" (1998), that they are given an operational platform.

Moments of Meeting: their significance for dyadic change

To characterise the processes of change within dyadic systems, Stern (1998) offers a number of well described constructs that are said to be pivotal to the direction and quality of dyadic interactions. Stern, drawing similarities between parent-child interactions and client-therapist exchanges, posits that *Present Moments, Moving along Periods, Now Moments, Moments of Meeting and Open Spaces* are all features of relational patterns that encourage "new ways-of-being-with-the-other" (pp300).

This micro-presentation of the inner workings of intimate engagements builds on earlier discussions of Stern's work and calls attention to the *how* of shared experiences and the outcomes. Stern leaves the reader in no doubt as to the contexts of these processes – dyadic exchanges. He, along with other members of the study group use synonymous terminology - enacted mutually (Stern, pp305), co-construction and mutually constructed regulatory patterns (Lyons-Ruth, 1998, pp285), mutual regulation of affect (Tronick, 1998, pp290), to describe how events of significance are negotiated.

Whilst these terms and constructs represent the continuous stream of shared experiences they importantly highlight shifts in individual and dyadic explicit and implicit knowledge. Without diminishing the importance of any of the constructs, for the purposes of the present study two will be described in some detail before the implications of their presence are discussed.

"Now Moments"

Through relatively unrehearsed periods of familiar exchanges the members of a dyad are said to be expressing their "schemes of ways of being with the other" (Stern, 1995). Predictable patterns of relating, with recognised response repertoires, characterise a free-flow of shared communication. For Stern the direction of this movement is essentially linear. It is into this context that the now moment arrives.

The now moment jolts each member of the dyad into a state of new alertness drawing on all systems for resolution. The now moment interrupts the coordinated interactions that have preceded it and acts as a beacon for the individual to marshal efforts to address its implications particularly in relation to the other member of the dyad.

This notion implies that the preparedness of each member of the dyad to respond to the moment will shape and direct the individual's representations of the event but more importantly representations of how it was mutually regulated (or not).
Each member is dependent on the other to derive the significance and meaning from the now moment. If this occurs a "moment of meeting' results.

"Moment of Meeting"

A moment of meeting is heralded when the interactants express (both implicitly and explicitly) something "unique and authentic" (Stern, 1998, pp305) to the arrested now moment. Moments of meeting are said to occur when "dual goals of complementary fitted actions and intersubjective recognition are suddenly realized" (Lyons-Ruth, 1998, pp286), and thus cannot be established without an awareness of other, and self in relation to other. It is in this intersubjective recognition that a "new intersubjective state" develops" (Stern, 1998, pp 305). In addition to this it is reasonable to suggest that the *quality* of the memories for, representations of, and behaviours assembled in this new state will be affected by many variables. It will be remembered that those features of early engagements – clarity of emotion expression, understanding of the meaning behind affective displays and a history of successful mutual negotiations – are likely mediators of the quality of the new states created.
The fundamental product of a moment of meeting is an expansion of "dyadic consciousness" (Tronick, 1998). In achieving this milestone of interactive capability, the outcome is a change in "implicit relational knowing" (Lyons-Ruth, 1998, pp284), or the knowledge of how to "be" with another. This knowledge is all at once "affective, interactive and cognitive" (Lyons-Ruth, 1998, pp 284).
For each interactant these premises have long-term implications for what is brought to subsequent moments of meeting. Also inherent in this model is the view that with each new shift in intersubjective dyadic experience, the quality of relational expectations broadens. Moments of meeting become the consummate pivots of relationship change and richness.
These principles are said to operate for both parent-child and therapist-client dyads. Sterns asserts that other outcomes of a now moment include the difficulties by an individual to recognise a now moment, or difficulties to mutually secure a moment of meeting. In the case of the latter, this implies that regular inability to meet in increasingly consistent and complex ways will have a negative effect on, and be expressed negatively in the dyad.

Stern further posits that within the parent-child relationship, failure to connect in moments of meeting is of less concern due to the fact that "developmental push" will ensure that the dyad will successfully actualise the opportunities presented by moments as they resurface. Yet what of dyads where this developmental push is compromised or even absent? What of dyads where the child for example has a developmental difficulty? Can this literature offer insight into how compromised interactive development can be arrested, facilitated and redirected?

It is in this context that the population for the present study must be viewed. Children who have a social-communicative disorder are not only at risk for developing aberrant communicative function, but also of remaining on the periphery of all social contact. For children with the diagnosis of Autistic Spectrum Disorder difficulties in social-emotional and affective development are profound and threaten the very fabric upon which interpersonal experiences are built. The nature of these issues will be highlighted with particular reference to the literature presented thus far, before a rationale for the present thesis is offered.

Children with an Autistic Spectrum Disorder: some issues around their emotional and affective development.

From the earliest recognition of "Autistic Disturbances of Affective Contact" (Kanner, 1943), there has been an interest in the social-emotional, communicative and cognitive difficulties that are present for children with this diagnosis. Specific difficulties relating to "abnormal social interactions, lacking in eye contact, and failing to imitate" (Short, 1984), have been highlighted. It has been suggested that these difficulties stem from a primary cognitive deficit resulting in the inability to develop a Theory of Mind (Baron-Cohen, Leslie & Frith, 1985), particular vagaries of cognitive style (Happe & Frith, 1994), and apprehension of emotional affectiveness (Hobson, Ouston, & Lee, 1988a; Hobson, 1993). Thus establishing the foundations of such terms as "aloofness" and "inappropriate social interactions" (Frith, 1993) has both challenged and polarised the views of researchers.

Early emotional development, its regulation and links between social-emotional development and cognitive functioning in autistic spectrum disorder (ASD) is found smattered throughout the literature. Children with this disorder, are characterised as having a different course of emotional development early in life (Kasari & Sigman, 1996). Specific deficits in recognition and response to emotions (Sigman, Kasari, Kwon, & Yirmiya, 1990),

a lack of understanding of emotional content in interactional exchanges, and showing a lack of coherent facial expressions in comparison to children without an ASD (Kasari, Sigman, Mundy, & Yirmiya, 1990), have been described.

In a preceding discussion, emotional expression was described as serving an integral role in communication. Children and their caregivers recognise emotions in each other and project readable facial expressions in interactive episodes. Yet children with an ASD typically have problems with emotional understanding and expression (Frith, 1993). The study of facial expressions using the MAX coding system has revealed that children with an ASD show more combinations or blends of facial movements, and some that did not fit within the coding system (Yirmiya, Kasari, Sigman, & Mundy, 1989). When the variety of blends were categorised as positive, negative or incongruous, children with an ASD showed significantly more incongruous negative blends (Yirmiya et al, 1989). These authors wisely draw the conclusion that the presence of a greater number of undetectable facial expressions can only serve to disrupt caregiver-child interactions (Kasari & Sigman, 1996).

Whilst this thesis does not explore the specificity of facial configurations offered by a facial coding system, these data are offered as a mere glimpse in the mirror at the experience of face-to-face interactions with a child with an ASD. The noxious effects on the signalling patterns of a significant other can only be imagined.

Yet what of the significant other in the interactive exchanges outlined above? As suggested in an earlier treatment of the topic, any alterations in the signalling process of one partner, is likely to have a marked effect on the other. There is some empirical data as to the effects of the child with an ASD, dysfunctional emotional signalling on a significant other.

It has been reported that mothers of children with an ASD smile less at their children's smiling, than mothers of 'normal' children (Dawson, Hill, Spencer, Galpert, & Watson, 1990). Further because smiling was rarely linked to looking, the suggestion is that less contingent smiling interrupted coherence in the mother-child dyad (Kasari & Sigman, 1996). The same authors also found that heightened sense of caregiver stress was associated with perceptions of difficult temperament in their children with an ASD. In addition these parents were less actively engaged in communication with their children.

These findings seem to suggest more than compromised signalling, and begin to open a window on the regulatory processes within these dyads. Stern (1995), poetically captures this as how the parent and infant negotiate the "shareable universe" (pp74), and the links with the relational perspective of emotion regulation (Campos et al 1989), and mutual regulatory processes at work (Tronick, 1998), can be made.

The foregoing literature would suggest that caregiver-child with an ASD dyads will more than likely demonstrate dysfunctionality within this frame of reference. This is in no way suggesting that children with an ASD cannot experience or communicate something of the emotional experience, rather that the interpretation for both the caregiver and the child is compromised.

How are situations/events disambiguated for these dyads? The literature on social referencing may provide some insights. It will be remembered that social referencing is predicated upon mutual attention to referent material and is heavily reliant on clear signals of responsivity. If children with an ASD signals are more ambiguous and not easily deciphered, then the ability to enter into growing intersubjective experiences will be at risk in this regard.

Important to this tenet is the finding by Dawson et al (1990), that children with an ASD show similar amounts of positive affect to those children matched for mental age, but do not *share* it as readily. A lack of coordination of affect and expressive displays has also been found (Snow, Hertzig & Shapiro, 1987; Attwood, Frith & Hermelin, 1988), which supports this finding. In addition, when comparing non-verbal indices of development such as gesture, it has been found that children with an ASD point to or share objects of interest with another much less than their matched for mental age controls (Mundy, Sigman, Ungerer, & Sherman, 1986).

Thus it is not the experience of emotion that is at issue here but rather that emotions and the expressions thereof, are not being used as coherent information carriers.

Even within this literature, authors have suggested that the socialisation of emotions within the contexts in which they occur needs to be charted. Kasari and Sigman (1996), hold that "appraisal and conceptual processes are important contributors to children's recognition and understanding of emotion" (pp126). As a result one must be drawn into conceptualising the foundations of appraisal processes from their earliest beginnings of making sense of and organising the myriad of sensations that pervade the child's environment. Effective processing of sensory experiences, enable calm attention to, and opportunities to engage in a mutual learning process with another. Compromised information processing systems threaten this process. "If an infant cannot organise what she sees well enough to make out her mother's smile, it makes no difference that another can" (Greenspan, 1997, pp48-49). Greenspan suggests that children with a pervasive developmental disorder, present with particular and individualistic sensory profiles, which show deficits in processing environmental stimuli (Greenspan & Weider, 1998). Based on his own work and research

that has grown from this work, he and others have developed a diagnostic system that reshapes and reconceptualises the terms "autism", and "pervasive developmental disorder". Numerous writings from the *National Centre for Clinical Infant Programs*, in Virginia, USA, have begun to change the way in which these children may be described and assessed (Greenspan, 1992; Prizant & Wetherby, 1990a). Using a multi-axial classification system the term *Multisystem Developmental Disorder (MSDD)*, has been employed to characterise children who have information processing difficulties with significant issues around communicative function. This classification is said to be complementary to the DSM-IV classifications, but is more specific in descriptive terms (Greenspan & Weider, 1998).

Nonetheless in this background of changing specifications and descriptors for pervasive developmental needs, the confounding effect of the issues outlined on mutually regulated patterns of interactions encouraging "new-ways-of-being-with-the-other" (Stern, 1998, pp 300) seems clear. Not only do these findings suggest deviations from expected emotional development and use of emotions for a child with an ASD, but more importantly serious implications for the intimate contexts in which they occur.

It will be remembered that suggested precursors to sharing emotionally with a significant other include mutual attention to referent material, mutual capture of the significance and salience of an "emergent moment", the search for and apprehension of the meaning behind expressive displays and dyadically negotiated journeys through emotional experiences. An absence of one or indeed all of these conditions is implicated in the difficulties of the dyad (where the child has an ASD), to connect in "moments of meeting" or develop chains of complex interactions around a number of mutual goals. Whilst not denying the ability of the dyad to connect, this would suggest that content and form of implicit knowledge will be compromised.

It is further suggested however that engagement in "moments of meeting" is a clear sign of the advancing development of the dyad. If "moments of meeting" are the true catalysts for individual and dyadic change as the Boston Study Group suggests, then their very existence speaks of a quality of relationship that drives the human need to enter into and share the world of another.

Rationale:

Summary and Conclusions

The literature reviewed on infancy and early childhood clearly points to the significance of early interactive experiences as the contexts for developmental growth. That these early exchanges are largely affective, suggests that emotionally laden experiences that invite mutuality and reciprocity, structure and determine future growth.

Indeed research is mounting, suggesting that the quality of early interactive patterns in the first half year of life predicts later developmental outcomes eg cognition (Ainsworth et al, 1978; Isabella & Belsky, 1991; Malatesta et al, 1989). This in no way implies that development is static or unresponsive to further modifications beyond this point, but hints at the influence that early socio-affective exchanges exert on all areas of development.

This is firmly supported by the ecological model which upholds the significance of the interaction between nurturing environments and individual characteristics (Bronfenbrenner & Ceci, 1995). It is mirrored in the transactional model which views development as the interface between active individuals and active environments (Sameroff & Emde, 1989), and is reflective of the biological literature instructing researchers to contemplate the effects of environmental factors on developing neuronal systems (Perry et al, 1995).

Although the contexts of these interactive experiences has been well discussed and documented, when one looks closely at the empirical literature several features emerge that seem incongruent with the theoretical premises from which they were derived.

In the case of the social referencing literature for example, studies typically use aspects of the child's behaviour in relation to "simulated" or "practiced" emotional expressions such as "fear, happy and neutral" expressed by the caregiver (Mumme, Fernald & Herrara, 1996). Yet little is reported of the mother's responses to the situation. It assumes within this paradigm that the expression remains in the form intended.

Other studies purporting to examine the influence of maternal facial expressions on infant expressions also report largely infant data. Haviland and Lelwica (1987) examined expression matching and found that infants only matched their mother's induced expressions part of the time. In another study, emotion-related characteristics of mothers and their infants were examined (Izard, Haynes, Chisholm, & Baak, 1991). Here infant measures involved self-reported data from the mother, and coding of facial expressions again used induced expressions of the mother in a positive-negative paradigm. Further,

newborns of depressed mothers were tested for orientation behaviour and facial expressions using modelling from the examiner (Lundy et al, 1996). Interactions with the mothers in this study were not explored. Similarly, infants responses to the timing of a peek-a-boo game were explored using an adult stranger (Rochat, Querido & Striano, 1999). No data as to whether infant responses to the stranger were similar to those when engaged with their primary caregiver were offered in this study.

The reason for raising these issues is not to negate the findings from these data regarding contingencies in caregiver and infant emotional expression, but rather to highlight how it is possible to propound the forces present in emotional functioning in dyads theoretically, and then mobilise methodology that separate them. If infant expressivity is both a function and determiner of caregiver expressivity *as much as* the caregiver's expressivity is a function and determiner of infant expressivity (Campos et al, 1989; Tronick, 1998), then data must chart the dynamic forces at work for both parties as a unit as well as separately. This is a guiding feature of the present study.

Yet what can be extrapolated from this for populations for which the usual timetable of emotional development is disrupted or does not emerge? The literature on social emotional development in infancy and early childhood is of paramount importance for children with a significant social-communicative disorder because it not only suggests methodology to explore social-emotional functioning, but also has serious implications for therapeutic intervention.

Researchers and clinicians must be encouraged not to abandon the features of early developmental change when faced with a child with a developmental difficulty. This is because inherent in the knowledge that has accumulated about how young children develop, are *principles of change* which invite learning along all available modalities. That early experiences are dyadic in form, that mutual regulatory patterns of responding abound to give meaning to the world, and that early emotional experiences create later developmental profiles, must be held relevant to all childhood populations. A child looks up to a primary caregiver who is signaling "Hi. I can see you." If acted upon this can become part of a predictable pattern of "When I look, I can find you". Then through the growth of repeated, predictable dyadically regulated emotional experiences the pair are able to build uniquely patterned histories of "This is what we do and how it feels when we are together". It is this that expands an individuals drive for connection and discovery, and is the context to which he/she returns for confirmation and comfort.

For these reasons the current study aimed to explore the inner workings of primary relationships with an emphasis on how events of significance are dyadically enacted. It was held that this would provide an appropriate context through which dyadic regulatory interactive patterns could be viewed and attend to what is seen by some as the real focus of analysis (Sameroff & Emde, 1989).

Current Study

A recent review of social skills training in programmes operating for children with an ASD (Hwang & Hughes, 2000), pointed to the dearth of information available on social communicative abilities of preschool children with an ASD enrolled in programmes which focus on the development of social interactive skills. The current study addresses this issue, by examining longitudinal data charting the social interactive development of preschool children enrolled in the Interaction Clinic, Champion Centre, Christchurch, New Zealand. This clinic provides an individualised programme of intervention to dyads where the child has a significantly compromising social-communicative disorder. Goals and outcomes centre around the child's ability to derive meaningful patterns of relating and responding through the primary relationship of which they are a part*.

A central premise of the present study was that "moments of meeting" (Stern, 1998), were seen as indexes to documenting change in the children, and for the dyads. The construct was chosen because it provided a theoretical and operational framework encapsulating principles of the development of interactive skills, with a corollary emphasis on application in the therapeutic arena.

For the purposes of this study, the "now moment" and "moment of meeting" were embedded in one generic construct "Moments of Meeting" (MOM), and operationally defined and described (see Appendix A). This allowed for closer attention to the consequences of the MOM, and provided a larger unit of time for analysis.

In addition to the MOM, another moment was identified as a further indice of dyadic exchanges. This was termed a "moving along moment" (MA). This moment fitted the theoretical description of the period of "Moving along" as outlined by Stern (1998), and was reflective of an episode of social referencing (see Appendix A for a full description).

The parameters surrounding both types of moments were well defined in operational terms, and refined in practice by the coding procedures.

One of the aims of the current study was to evaluate the utility of moments of meeting as indicators of the quality of shared interactive experiences between children and their primary caregivers. Their number, length and accompanying behavioural characteristics would be seen as an index of the child's ability to enter into reciprocal exchanges, and although highly speculative suggests a quality of intersubjectivity or "implicit relational knowing" embedded in the exchanges.

It was anticipated that through consistent application of the operationalisation of "moments of meeting" a close examination of interactions over time might ensue.

It was hypothesised that the number of, and time spent in "moments of meeting", would increase over time. This increase in dyadic emotional sharing would be seen as a natural product of increasingly complex, emotional connections made between the interactive partners.

In addition, the presence of "moving along moments", would point to improved regulatory mechanics within the dyad. In addition any increase in the child's ability to initiate or engage in connected moments would be seen as an indication that the child was becoming a willing interactive partner. Changes or increases in observable behaviours (see Appendix F1, F2, F3, F4, F5, F6, expressed in either of the moments in sessions 1, 3, and 5 would be seen to support this hypothesis.

A single-case study design was preferred, as the content and form of interactions, as suggested in the literature is navigated in unique and dyadically distinct ways. Generalisation from one dyad to another is not readily indicated or warranted given this view. Thus dyads acted as their own controls over time so that information pertaining to the interactional outcomes of their therapeutic journeys remained dyad specific.

**Specific information relating to the philosophy, guiding principles and aspects of Dyadic Interactive Therapy may be obtained from the Interaction Team, Champion Centre, Burwood Hospital, Christchurch, New Zealand.*

Chapter Two

METHOD

Subjects

Subjects were six parent-child dyads (five mother-son dyads, and one mother-daughter dyad). All children presented to the Champion Centre for assessment of development with ages ranging from 20 months to 3 years 9 months (mean age = 2 years 7 months). At assessment all children presented with a significant social-communicative disorder as described by a registered Speech-Language Therapist. Subsequent to this assessment, five subjects were formally diagnosed with an Autistic Spectrum Disorder by a Paediatrician, while the sixth subject was diagnosed with a Semantic Pragmatic Disorder.

Weekly sessions of Dyadic Interactive Therapy (DIT) were attended by the each of the dyads. Each session was videoed. In addition to the involvement of the mothers, three fathers and one nanny also attended regular sessions of the therapy. For the purposes of internal consistency, these sessions were excluded from the data pool.

Dyads attended weekly sessions for varying periods of time ranging from 11 months to – 3 years 3 months (mean time spent in therapy 23.6 months). In addition all dyads attended weekly Occupational Therapy.

Subsequent to therapeutic intervention, four subjects were mainstreamed into regular classroom settings with the other two enrolled in satellite classes attached to state schools. Four of the subjects transferred to a multidisciplinary developmental clinic from DIT before transition to school, and two transitioned to school directly from DIT.

The dyads were selected from a total pool of 11 dyads whose therapy sessions were captured on video. Five of these dyads had to be excluded from the study due to the fact that the video material relating to their therapy was not of sufficient quality or quantity for analysis.

Written permission was obtained from parents to make the videos of their therapy sessions available for data analysis, the purpose of which was outlined. Permission was also obtained from parents for the employment of a coder.

Table 1: Age (in years and months of the child) at entry and exit of Dyadic Interactive Therapy (DIT) and total time spent in DIT.

Child Characteristics

Dyad	Gender	Age entry DIT	Age at exit DIT	Length of time spent in DIT
A	M	2yrs 6mo	4yrs 8mo	2y 2mo
B	M	2yrs 9mo	6yrs	3yrs 3mo
C	M	2yrs 5mo	3yrs 9mo	1yr 4mo
D	M	2yrs 10mo	3yrs 8mo	11mo
E	M	3yrs 10mo	4yrs 11mo	13mo
F	F	2yrs 11mo	6yrs	3yrs 1mo

Procedure

Videotapes

Videotaping of one hour, weekly DIT sessions was carried out on site at the Champion Centre in a low-stimulus room. Every attempt was made during therapy to tape all parts of the weekly sessions in a continuous second by second fashion. A variable amount of therapy was captured on the videotapes for dyads ranging from approximately 10 minutes to 55 minutes.

To maintain uniformity, all sessions used during coding procedures were restricted to 30 minutes duration. This was true for five of the dyads. For the sixth dyad, sessions used for coding were restricted to 20 minutes duration due to a lack of continuous 30 minutes of therapy recorded in early sessions.

Of paramount importance was the presence of the mother and the child on the screen at the same time. In early reviews of the material it was decided that this condition needed to be met at least 75% of the time. Thus in a 30 minute session, a minimum of 22.5 minutes would involve both the mother and the child being on the screen *at the same time.*

With these restrictions, a large number of taped therapy sessions remained available to form the actual data pool. A final group of sessions for each of the 6 dyads were randomly chosen at regular intervals of therapy (n=33). The times for coding were recorded and in all

but three of the sessions the time started at the beginning of a session. At times technical difficulties, relating to the time of recording, affected the start time of sessions, but all videos showed a progression through a familiar sequence of events common to all therapy sessions. Whilst the content of sessions differed between dyads somewhat, within dyads it remained constant.

Each videotape was screened for quality and clarity of action, and coded by an individual code to preserve confidentiality. Each video tape from which a session was chosen were 3 hours long and recorded at 25 frames per second.

Coding Procedures

One independent rater blind to the hypotheses of the study was trained to code the tapes according to the operational definitions (see Appendix A) and form provided. The recording form (see Appendix B), called for the start and finish times of moments of meeting and moving along to be recorded, along with the behavioural descriptors of antecedents and consequences of the moments. Training was accomplished by reviewing the operational definitions and coding forms, and clarifying terms that were unfamiliar. Two sessions of therapy not used in the study, were watched by the independent rater and this author (2^{nd} coder) together, to place the definitions in context and clarify any procedural questions arising.

This was followed by both coders independently viewing 6 sessions of therapy not used in the study and applying the definitions to the data on screen. It became obvious to both coders during the early stages of this coding period that technical concerns (eg tapes not rewinding to 0.00) meant that coding procedures had to be altered. The coding of the 6 sessions changed from time periods of moments measured in minutes and seconds, to the number of frames per moment. This meant that the start and finish of each type of moment has to be identified and the frames counted manually. When the 6 sessions had been coded and inter-rater reliability calculated, the pre-selected tapes of sessions of raw data for the present study, were coded using the same definitions and recording form.

Thus three coding procedures were conducted; 1) initial coding of sessions (n=2), 2) reliability coding procedure (n=6), and 3) experimental coding procedure (n=33).

Inter-rater Reliability

A measure of inter-rater reliability was calculated for each of the 6 non-experimental tapes using the following formulae:

$$\frac{\text{Agreed of number of moments}}{\text{Number of agreements + number of disagreements}} \times 100$$

And:

$$\frac{\text{Total agreed number of frames per moment}}{\text{Total number of agreed frames per moment + total number of disagreements of frames per moment}} \times 100$$

Table 2: Percentage agreement scores for number of moments identified in reliability coding procedures.

Tape number	Number of moments Coder one	Number of moments Coder two	Percentage Agreement
1	7	6	85.7
2	12	14	85.7
3	15	17	88.2
4	12	11	91.6
5	19	21	90.4
6	10	11	90.9

Table 3: Percentage agreement scores of number of frames of moments identified during reliability coding procedures.

Tape number	No. of frames per moment – coder one	No. of frames per moment- coder 2	Percentage Agreement
1	No frames recorded	No frames recorded	-
2	462	535	86.4
3	966	884	91.5
4	256	216	84.3
5	545	601	90.7
6	262	252	96.2

Coding of Tapes for Current Study

Once reliability procedures were complete, the pre-selected sessions to be used in data analysis were coded according to the same procedures. The number of sessions coded during experimental coding procedures per dyad varied: Dyad 1 (n=5), Dyad 2 (n=6), Dyad 3 (n=5), Dyad 4 (n=6), Dyad 5 (n=6), Dyad 6 (n=5), total number of session = 33. This was due to factors such as length of time in therapy, number of people attending sessions and quality and quantity of therapy on individual tapes. The tapes were coded randomly according to dyad, and randomly according to order in sequence of therapy to limit access to information regarding the session's position in therapy relative to those of other sessions (order effects).

In addition to the coding of MOM's and MA's, behaviours displayed in every moment (both MOM's and MA's), were identified and recorded for data analysis, using the behavioural definitions provided. Reliability between the two coders using the behavioural definitions reached 89% during the initial coding period and the same definitions and forms were used during the experimental coding procedures.

Chapter Three

RESULTS

The first part of this section presents the data analysis for each of the dyads separately. The means and standard deviations of each type of moment are presented graphically (see Appendix D for the table for all dyads) for each session. In addition frequency data are offered relating to observed behaviours within each moment type across three sessions. The distribution of both types of moments across three sessions is also presented for each dyad. In the second part of this section, the results of a three-way analysis of variance (ANOVA) of between subject factors are reported. The analysis was performed on the variables dyad, session and moment type which explored the data for potential differences and main effects. A summary of results then follows.

CASE ONE: Dyad 1

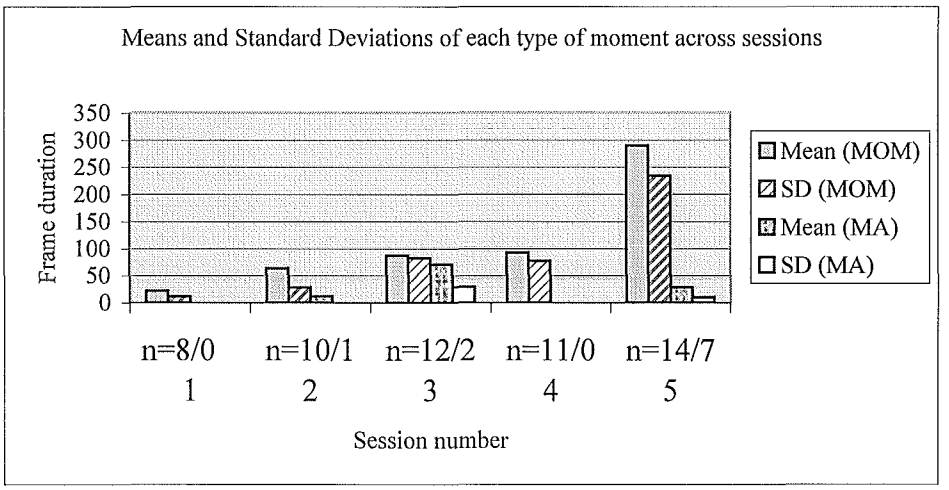


Figure 1: Means and Standard deviations of each type of moment across all sessions. The number of each type of moment is recorded as "n" in each session with MOM the first number and MA the second.

Figure 1 shows an increase in the mean no. of frames of MOM's across all sessions. There is a corresponding increase in the standard deviations also with a slight decrease between sessions 3 and 4. The high standard deviations recorded for MOM's reflect a high level of variance around the mean and greater variability in engagement periods. Mean no. of frames for MA's is considerable smaller than MOM's, with correspondingly smaller standard deviations. This suggests less variance around the mean for MA moments.

The number of each type of moment increases across sessions with the greatest number recorded at session 5. Although the increase from session four to five is only 3 moments the mean time spent in MOM is considerably greater. This suggests that longer periods of time were spent in dyadic engagement in session 5.

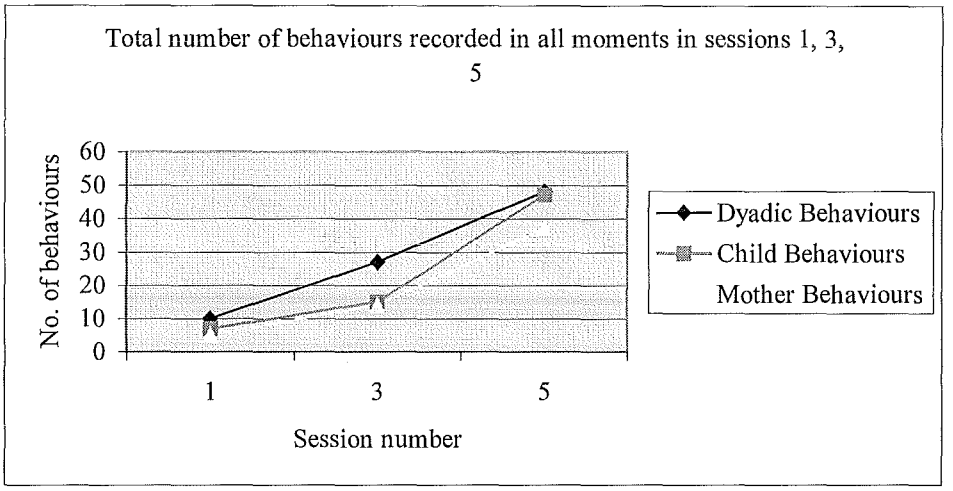


*Figure 2.*Total number of behaviours recorded for sessions 1, 3 and 5.

Figure 2 provides data which indicate an increase in the number of all types of behaviours, that is dyadic, child and mothers across sessions. Whilst there was a slight drop in child behaviours from session two to session three with a corresponding rise in the mothers behaviour, the data suggest that with increasing sessions behavioural indicators of MOM increase also. It is interesting to note that the child's behaviours across the sessions are generally greater in number than the mothers, although the data also suggest that there is a similar rate of responding per session as indicated by the near parallel lines from session 1 to 2. Dyadic behaviours remain higher than that of either the mother or the child's behaviour and may indicate the level of engagement present.

Embedded in the data (see Appendix F), are two interesting findings for Dyad 1. Both imitation responses and cooperative play initiators (child and mother behaviours), do not emerge until session 3 and session 5 respectively. Thus they are late to emerge in relation to mutual gaze, physical contact and affect match.

Similarly imitation responses for both mother and child were not observed until session 3. This all suggests that the total number of behaviours in the three categories at session five is not only representative of a greater number of behaviours but also of behaviour type.

In an attempt to examine more closely the inner workings of the therapy session, scatter plots were devised to examine the spread of the moments in three sessions (1, 3 and 5) The results are recorded in figures 3a, 3b and 3c.

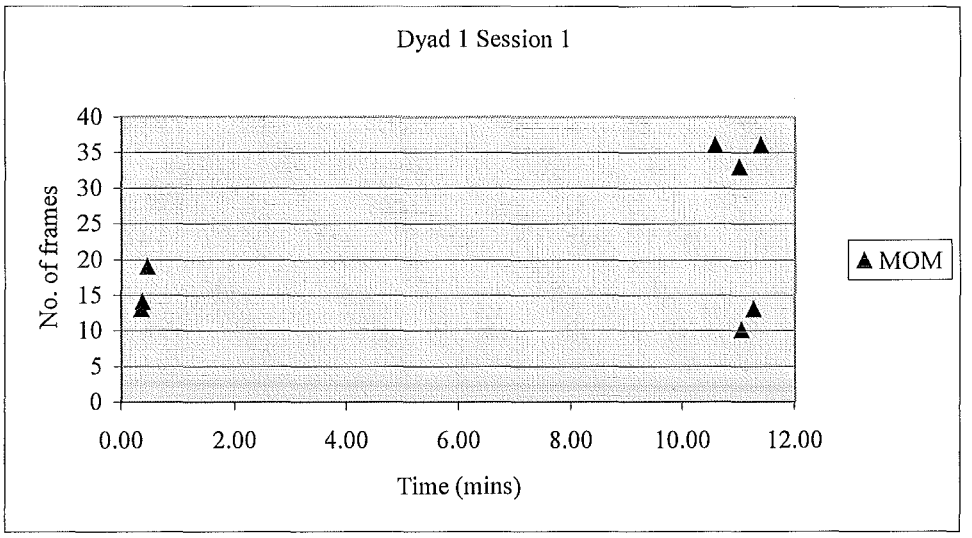


Figure 3a The distribution of each type of moment in real time (mins) in session 1.

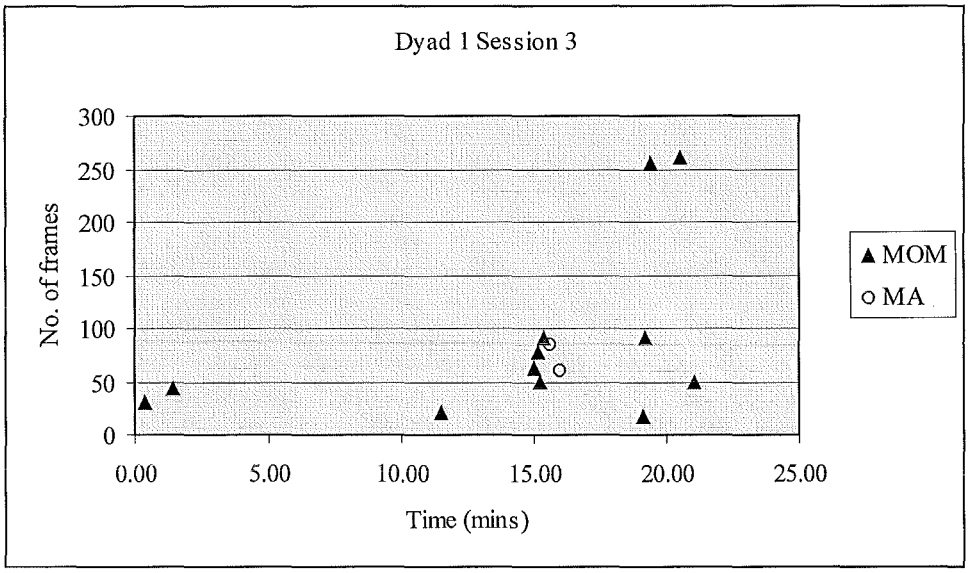


Figure 3b The distribution of each type of moment in real time (mins) in session 3

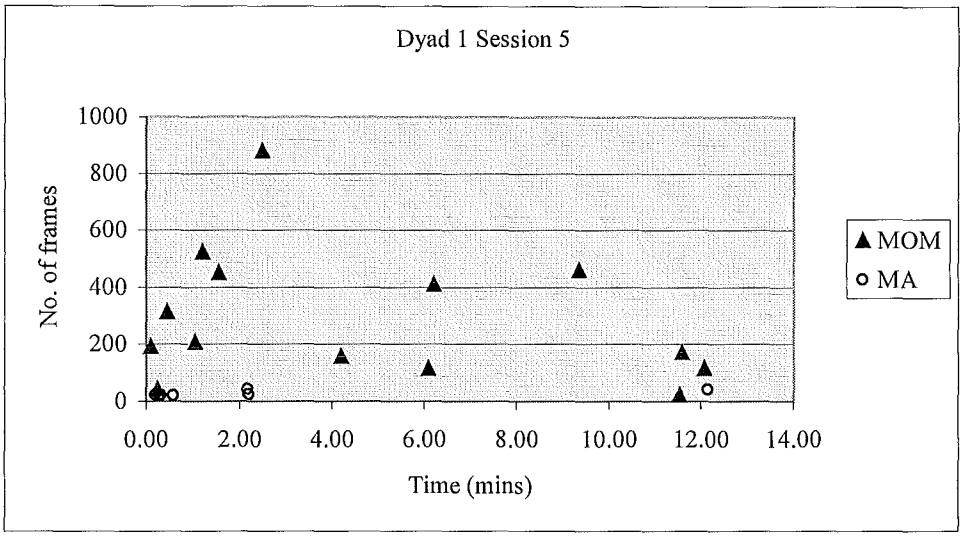


Figure 3c The distribution of each type of moment in real time (mins) in session 5

It can be seen from figures 3a, 3b and 3c that the distribution of moments per session varies. In figure 3a there is a small cluster of moments at the beginning of the session with in excess of 10 minutes clear of any moments. Figure 3b indicates a wider spread of the moments with a small space between the first two moments and the next moment approximately 10minutes later. Figure 3c shows a wider spread of the moments in session 5 but over a smaller time frame (12 minutes) than session 3 (21 minutes, see figure 3b).

By comparison, MA moments appear to cluster around clusters of MOM's. Figure 3b shows the two MA moments occurring within the same five minutes of session 3 that 7 out of a possible 12 MOM's occur. Similarly figure 3c shows a clustering of MA moments (n=6 out of a possible 7 for the session), around half of the number of MOM (n=14) in the session. These moments were recorded in the first four minutes of the session. These data must be interpreted in light figure 1 where there is a mean increase in the frame duration of MOM from session 3 to session 5. Given the distribution and clustering of both types of moments in these sessions implies a relationship between both types of moments. Whilst highly speculative, the clustering may be a function of the content of the therapy session not reported in the data.

CASE TWO: Dyad 2

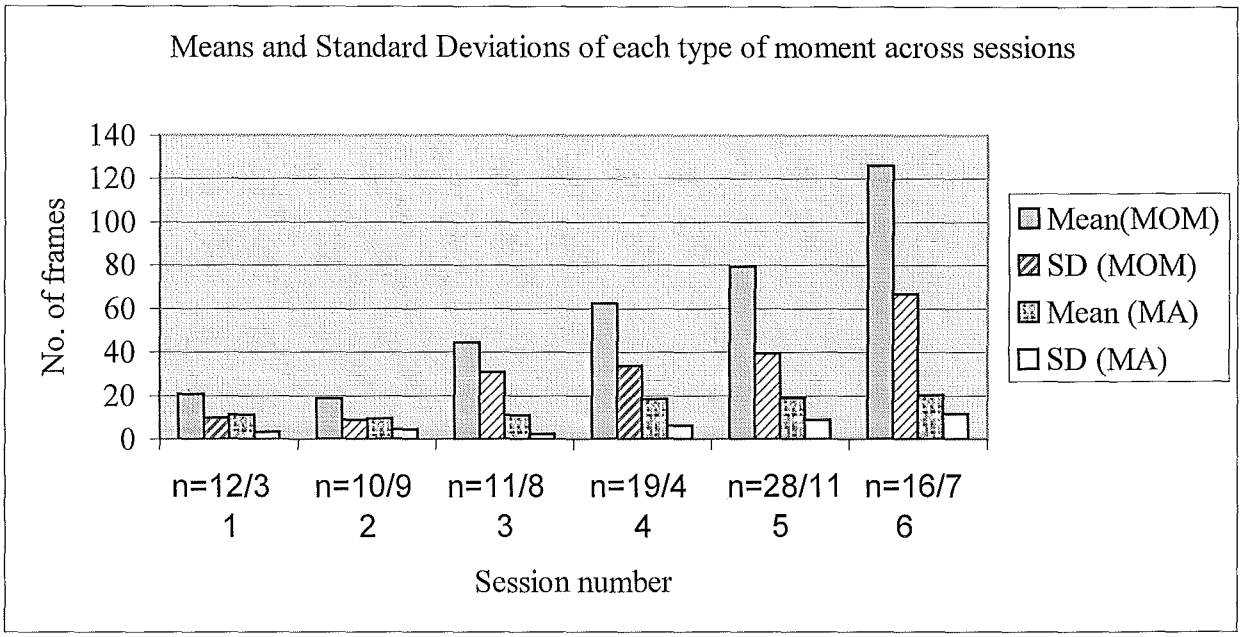


Figure 4 Means and Standard Deviations of each type of moment across all sessions. The number of each type of moment is recorded as "n" in each session with MOM the first number and MA moments the second.

Figure 4 shows a steady increase of the mean no. of frames and standard deviations for MOM's across from session 2 to session 6. This suggests that as the mean frame duration increases so does the variability around the mean. The frequency of MOM's is stable for the first three sessions then increases in session 4 to 19, and again in session 5 to 28, then decreases again to 16 in session 6. This indicates that although there are less MOM's occurring at session 6 they are longer in duration. Thus the number of MOM's do not necessarily indicate the size of the interaction in this case. This would seem obvious given that the longer the dyad spent in each MOM, restricted the number of such moments to be observed.

Instances of MA's however show a different pattern. Figure 4 shows similar no. of frames in sessions 1 – 3, a slight increase between sessions 3 and 4, and again similar mean no. of frames at sessions 4 – 6. The standard deviations around the means of MA's remained low in comparison to the standard deviations of the MOM's, showing only slight increases from session 3 to session 6. From session 1-3 the standard deviations for the MA moments were lower than the last three sessions. This suggests greater variability around the means of MA moments in later sessions. The number of MA moments showed no pattern across the 6 sessions indicating the number of MA moments cannot predict the variability of the duration of the moments.

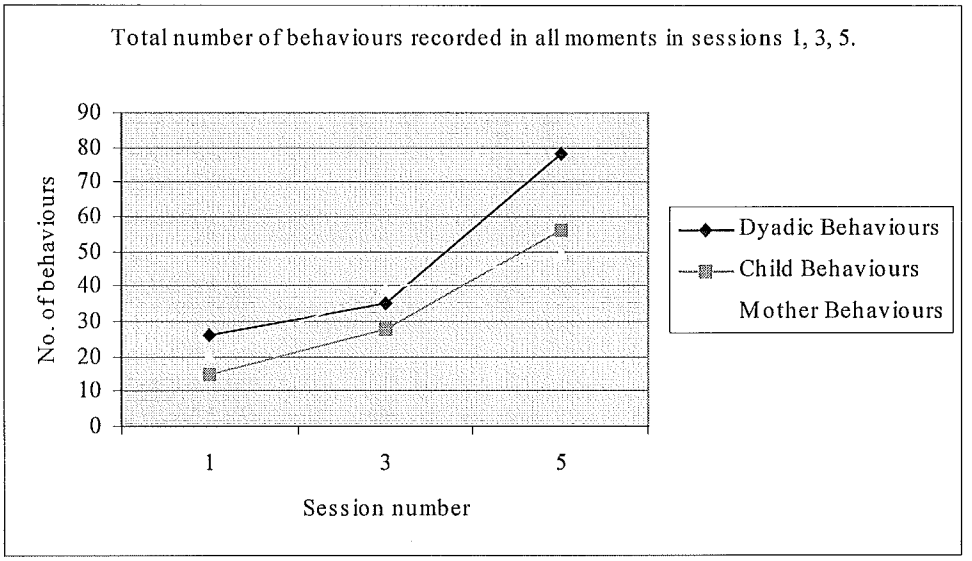


Figure 5 Total number of behaviours recorded in each category across sessions 1, 3, and 5.

Figure 5 shows an increase in all three types of behaviours across sessions. Apart from session 5, the number of behaviours displayed by the mother are larger than those of the child. At session 5 the child's behaviours are larger than the mother's suggesting more behavioural displays in both types of moments. Embedded in these data (see Appendix F), is the finding that imitative behaviours in the child and cooperative play behaviours for both interactants did not feature in the early sessions. Many instances of Dyadic Behaviours including affect match and mutual smiling were evident from the earliest session suggesting this dyad was connecting with range of behavioural repertoires at their disposal. Data to support this are found when Fig. 5 is interpreted in light of Fig. 4 where it can be seen that an increase in the number of moments at session 5 compared to the moments recorded at session 1 and their comparative mean no. of frames scores indicate shifts in quantity and quality of interactions.

The inner workings of three sessions for Dyad 2 are presented in figures 6a, 6b and 6c.

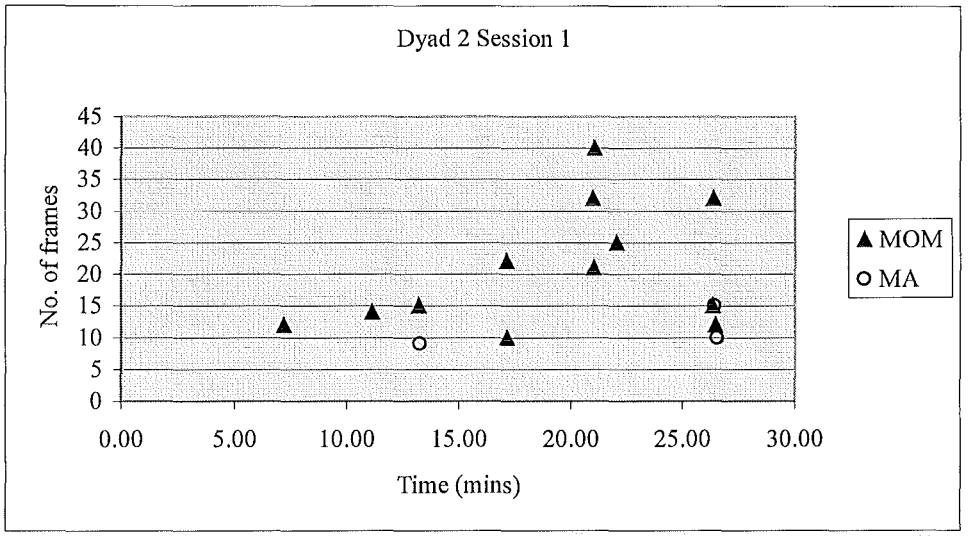


Figure 6a The distribution of each type of moment in real time (mins) in session 1

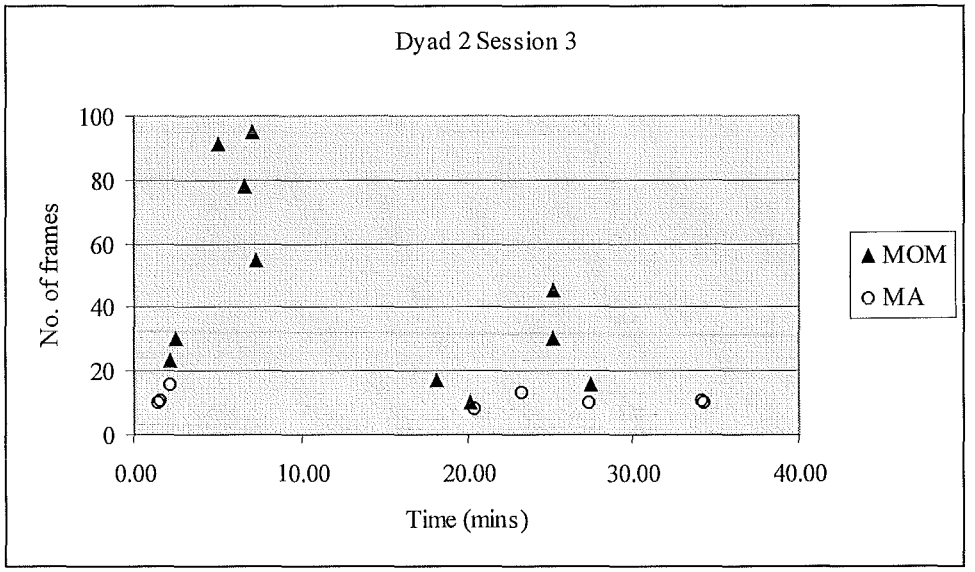
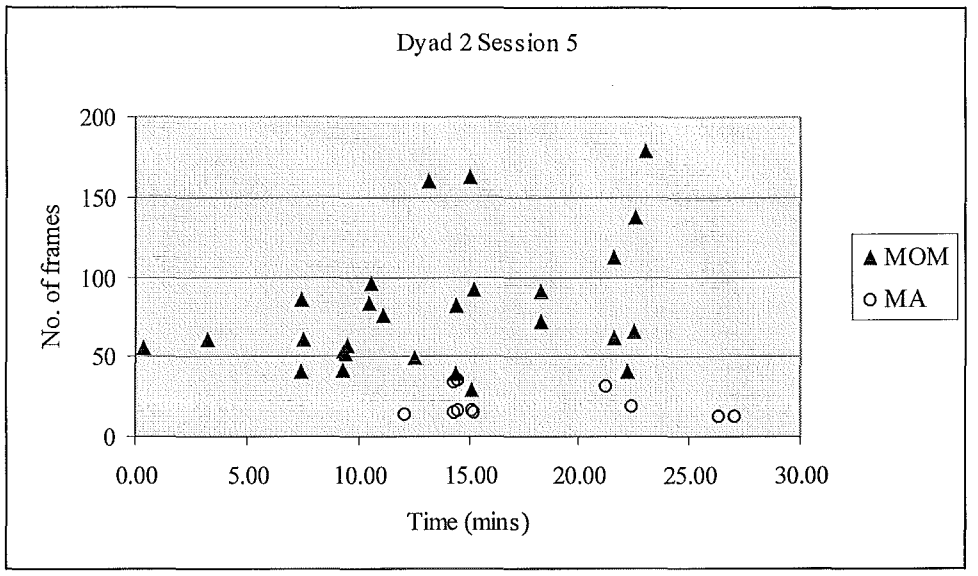


Figure 6b The distribution of each type of moment in real time (mins) in session 3.

Figure 6c The distribution of each type of moment in real time (mins) in session 5.



Figures 6a – 6c show clearly the size of the MA moments in the three sessions. They are largely smaller by comparison to the MOM moments and distributed along the bottom sections of the scatterplots. In figure 6c for example there are 7 MA moments that are very similar in size. This points to the small amount of variability suggested by the graph in Figure 4.

The increasing size of the number of frames on the vertical axes (a top range of 45, 100, and 200 respectively), is indicative of the increase in the size of the MOM moments at each data collection point.

Whilst MOM instances appear to be evenly distributed throughout the three sessions (with the exception of a small break between 7 and 18 minutes in session 3), there is a cluster of 7 MA moments (n=11 for the session), around 10 MOM moments in a five minute time frame, out of a possible 30 minutes. Whilst the data do not suggest a reason for this, it is possible to see from figure 6c that within this time frame the MA moments are interspersed or spread through the MOM moments. Again this suggests a relationship that may be directly related to the content of the therapy session.

CASE THREE: Dyad 3

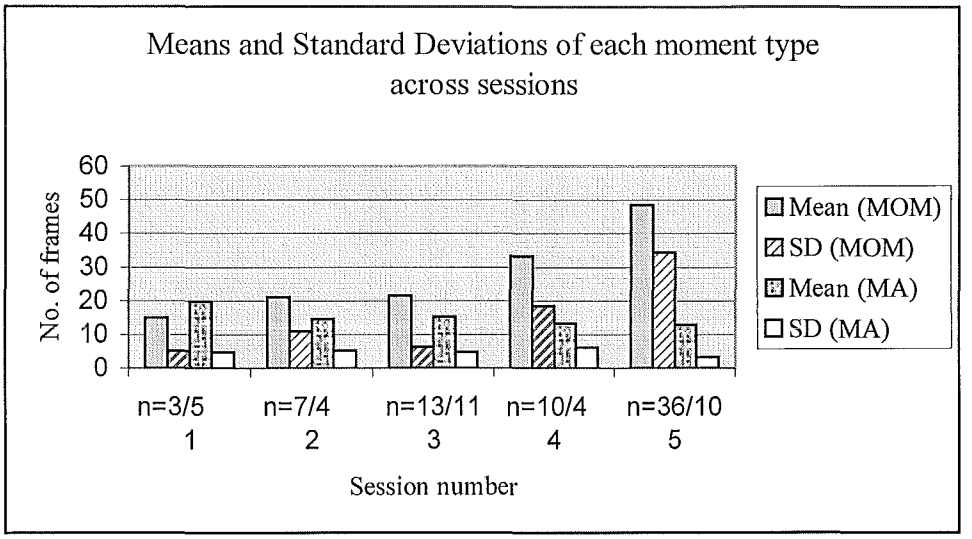


Figure 7 Means and Standard deviations of each type of moment across all sessions. The number of each type of moment is recorded as "n" in each session with MOM the first number and MA the second number.

The data in figure 7 show an increase in mean no. of frames of MOM's from session 1 to 5. There is a corresponding increase in the standard deviations for these means with the exception of a drop at session 3. This suggests that overall there is an increase in mean no. of frames accompanied by an increase in the variance around the mean. There is a general trend toward an increase in the number of MOM's recorded with a slight decrease at session 4. Despite this decrease the mean amount of time spent in MOM's at session 4 was greater than session 3 and less than session 5, again suggesting that the cardinal number of MOM's, does not predict amount of time the dyad are engaged.

By contrast there is a slight decrease in the mean no. of frames of MA moments across the six sessions. With the exception of a very small increase from session 2 to 3, this pattern is observed over the other five sessions. The standard deviations of MA's are small in comparison to the means, even in the sessions where the number of MA moments is greatest (i.e session 3 and 5). The differences between the means and standard deviations is greater for MOM's compared to MA's, indicating that there is greater variance in MOM's.

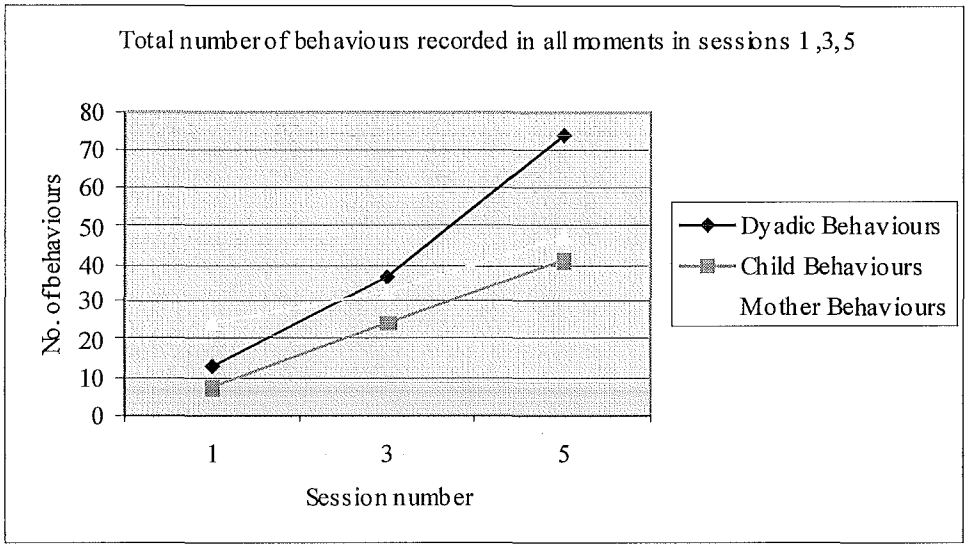


Figure 8 Total number of behaviours recorded in each category across sessions 1, 3, 5.

Figure 8 illustrates the linear increase in the child's behavioural repertoire over the three sessions. All three data collection points however show lower numbers of child behaviours in relation to the number of behaviours the mother displayed. There is a convergence in both interactant's behaviours at session 5 offset by a sharp increase in the number of dyadic behaviours. This must be interpreted in light of the fact that at session 5 there was a corresponding sharp increase in the number of moments recorded (see Fig. 7). Thus not only was the dyad connecting for more often and for longer periods as the mean no. of frame attests but also with increased number of responsive behaviours.

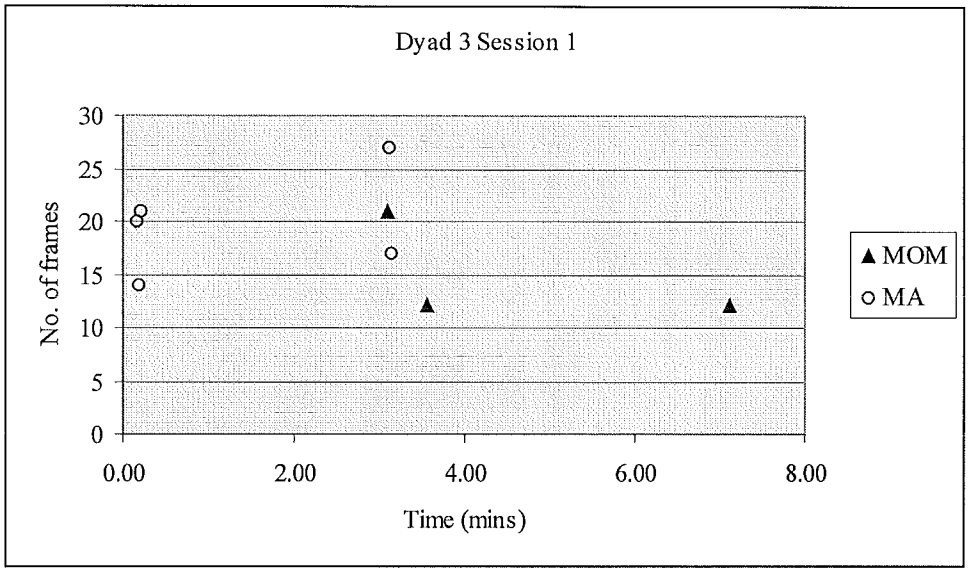


Figure 9a The distribution of each type of moment across session 1.

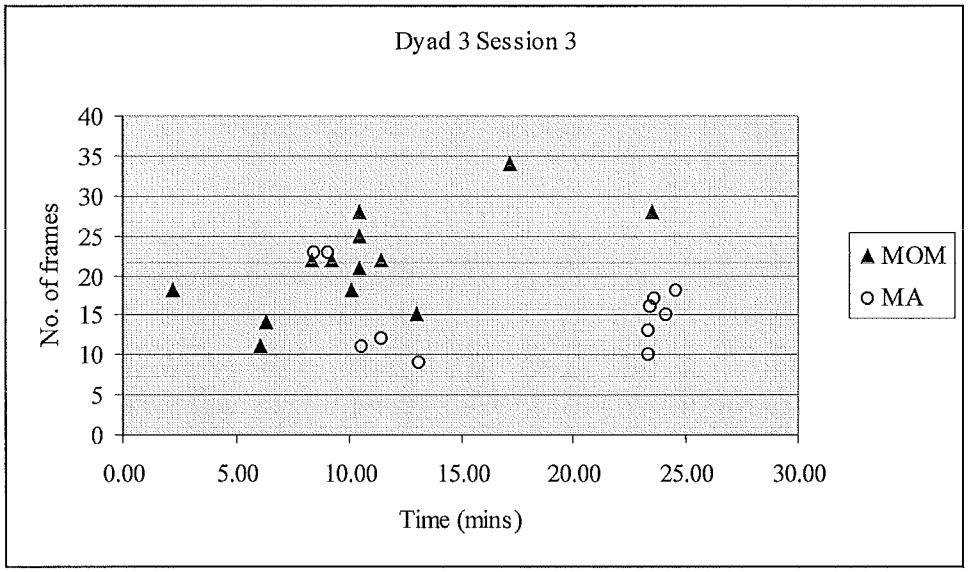


Figure 9b The distribution of each type of moment across session 3.

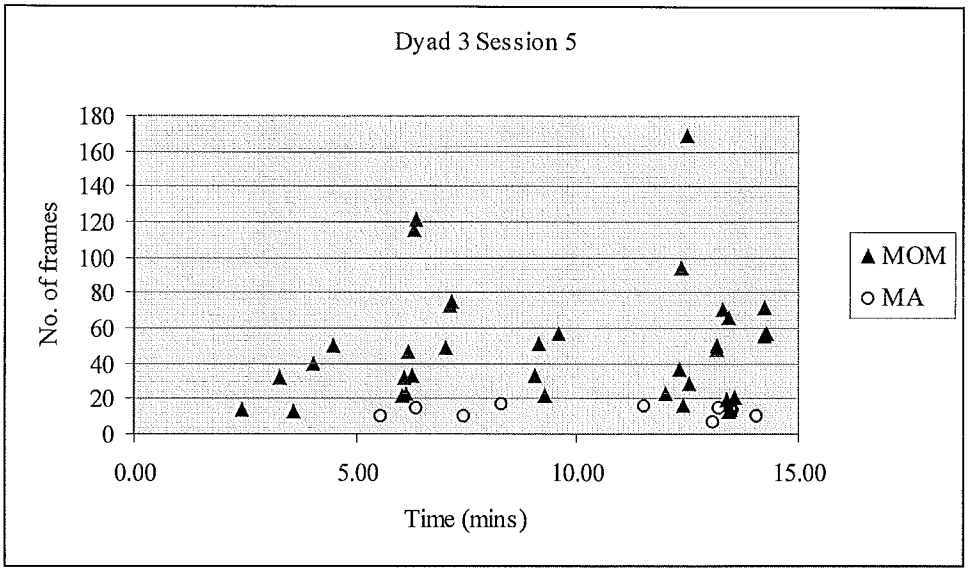


Figure 9c The distribution of each type of moments across session 5.

When commenting on the distribution of each moment type across the three sessions for Dyad 3, a striking feature of the scatter plots emerges. There is a great amount of variability around the length of time in each session where moments were recorded. It will be remembered that the sessions available for coding for this dyad ranged from 20 to 25 minutes. Thus the small range time (8 minutes) in session 1 must be offset by the fact that for at least 12 minutes of the session there were no further examples of moments recorded. By contrast a full range of 25 minutes in session 3 yielded some clustering of MA's around MOM's between 8 and 13 minutes where 8 out of a possible 13 MOM's are recorded, and 5 out of a possible 11 MA moments were identified. A second cluster of MA's was identified at the end of session 3, around one comparatively large MOM.

A further reduction in the time in session 5 where moments were recorded (15 minutes out of a minimum 20), however presents a wider distribution of each type of moment across the session with the size of MA's appearing well below the bulk of the MOM's.

Thus there is a trend toward the spreading of moments in the later session, however the time through which these moments are recorded show a lack of consistency across sessions where the dyad are engaged. Thus the length of therapy session is not a predictive feature of the direction or size of the interaction. The scatterplots do however show a clear increase in the number of frames of MOM's across the three sessions and this is supported by the mean increase in MOM's shown in figure 7. Possible reasons for these unique features of dyad 3 can only be speculative, may be embedded in the activity of the therapy session and

a function of the dyadic forces operating on any one particular day for this dyad. This could be true for any of the dyads.

CASE FOUR: Dyad 4

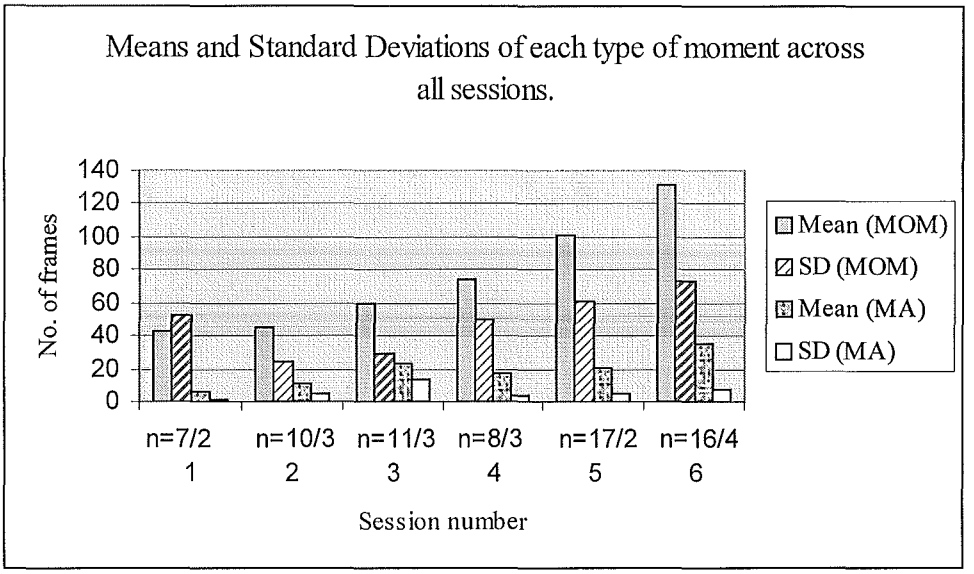


Figure 10 Means and standard deviations of each type of moment across all sessions. The number of each type of moment is recorded as "n" in each session with MOM the first and MA moments the second.

Figure 10 shows a clear increase in the mean number of frames for MOM's across the six sessions. The number of MOM's also shows a general increase with a slight drop from session 3 to 4, with 17 and 16 recorded at session 5 and 6 respectively. The number of moments then does not indicate the mean size of the interactions identified, suggesting that whilst the members of the dyad are connecting on more occasions across the sessions they are also connecting for longer. A corresponding increase in the *sd's* around MOM's also indicates the there is a high level of variability in the amount of time of these connections. On one occasion the *sd* is higher than the mean of MOM's, and this is the result of an outlier in session 1 (see figure 12a).

By comparison the mean no. of frames for MA moments shows an increase across the first three sessions, a drop in session 4, to rise again at session 5 and again to the highest point of all sessions at session 6. A similar pattern for the *sd's* for MA moments is evident, despite the fact that the number of MA moments recorded across all sessions yielded a small range (2 – 4). This suggests that as the mean no. of frames increases so does the variability.

The means of MOM's are larger at each session than those means of MA moments.

Behavioural indices of these findings are now presented.

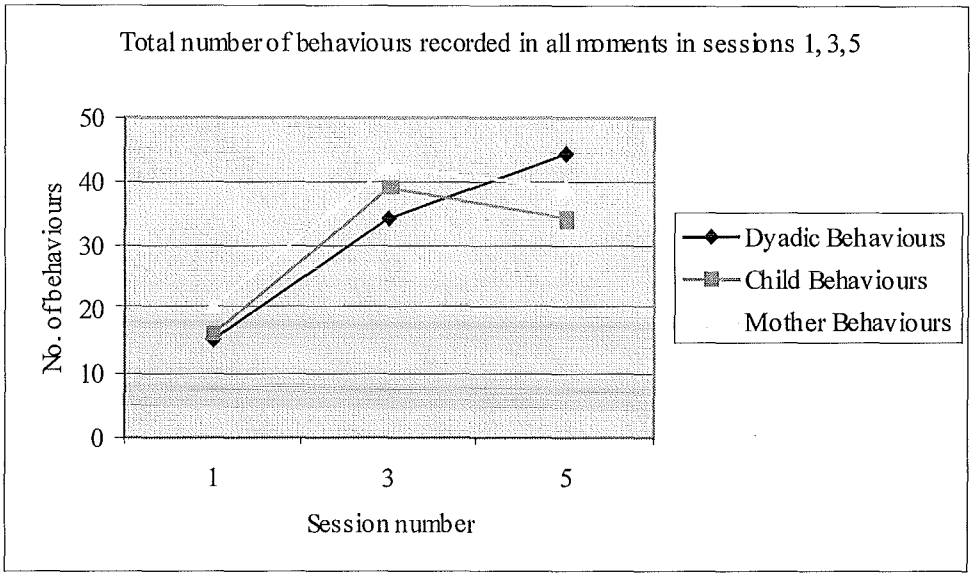


Figure 11. Total number of behaviours recorded in each category across sessions 1, 3, and 5.

Figure 11 shows that the behaviours exhibited by the mother and the child show a similar pattern across the three sessions. The number of behaviours recorded are strikingly similar and follow a similar trajectory over the three sessions. At each data collection point the mother's behaviours are always greater in number than the child's, despite the fact that overall the number of dyadic behaviours have increased. The behavioural features of this dyad's interactions suggest that the dyad are responding with similar quantities of behavioural displays and may indicate a contingent relationship between the child and mother's behaviour. The corrollory to this postulate is an increase in engagement behaviours. If this is interpreted in light of the data in Fig. 10 it can be seen that this pattern of responding is occurring as the mean amount of time in engagement is increasing.

How these patterns are played out in real time is indicated by figures 12 a – c.

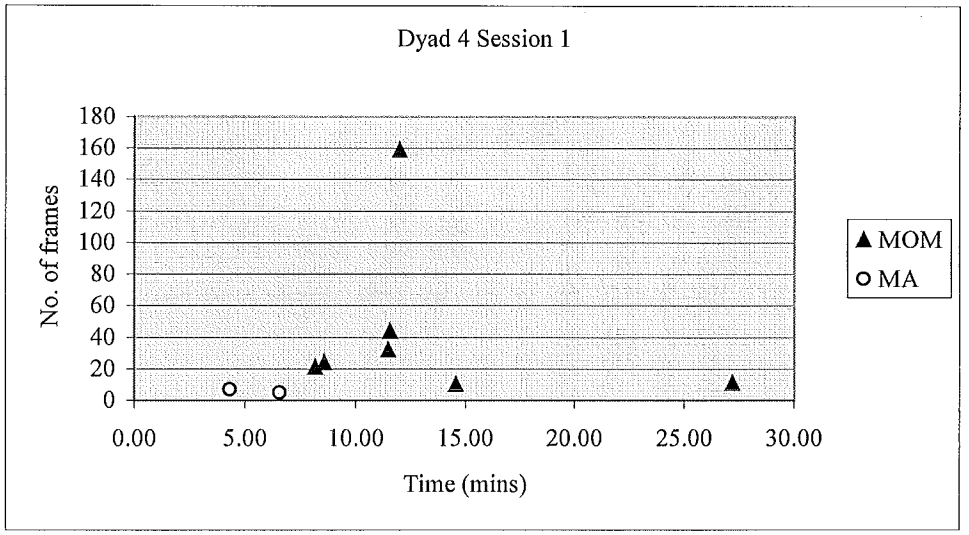


Figure 12a The distribution of both type of moments across session 1.

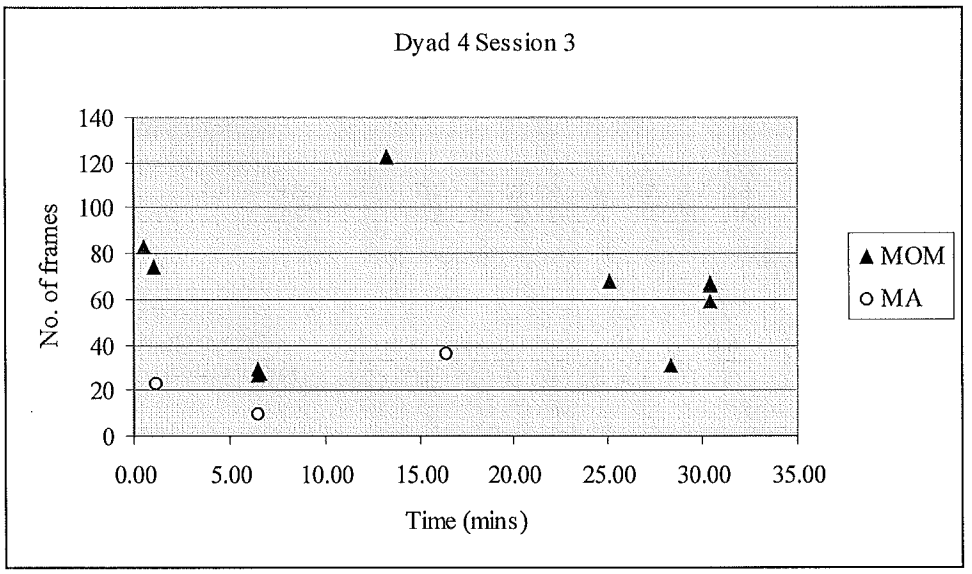


Figure 12b The distribution of each type of moment across session 3.

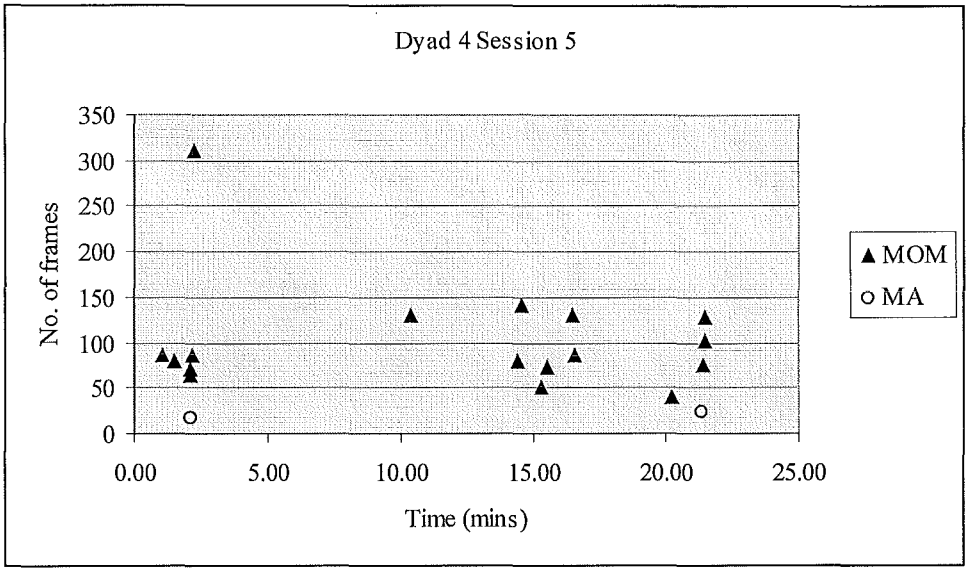


Figure 12c The distribution of each type of moment in session 5.

When looking at Figures 12a – 12c it can be seen that one feature of all the sessions is the presence of an outlier. For session 1 and 3 this occurs towards the midpoint of the sessions, whilst in session 5 it is within the first five minutes. This effectively adjusts the mean no. of frames for each session, and in the case of session 1 the large difference between the outlier and the rest of the moments is reflected in the *sd* being larger than the mean.

If one were to exclude the outliers from the data then the scatter plots would reveal a gradual rise in the size of the MOM's across the three sessions. In addition to this, the scatter plot at session 5 would suggest a wider spread of MOM's relative to the distributions in sessions 1 and 3. The scatter plots would also suggest a clustering of MOM's at intervals along the session.

In contrast the relatively low number of MA's in the sessions show no apparent pattern apart from session 5 where a MA is recorded in the first five minutes and the last five minutes in close time frame to a small cluster of MOM's.

CASE FIVE: Dyad 5

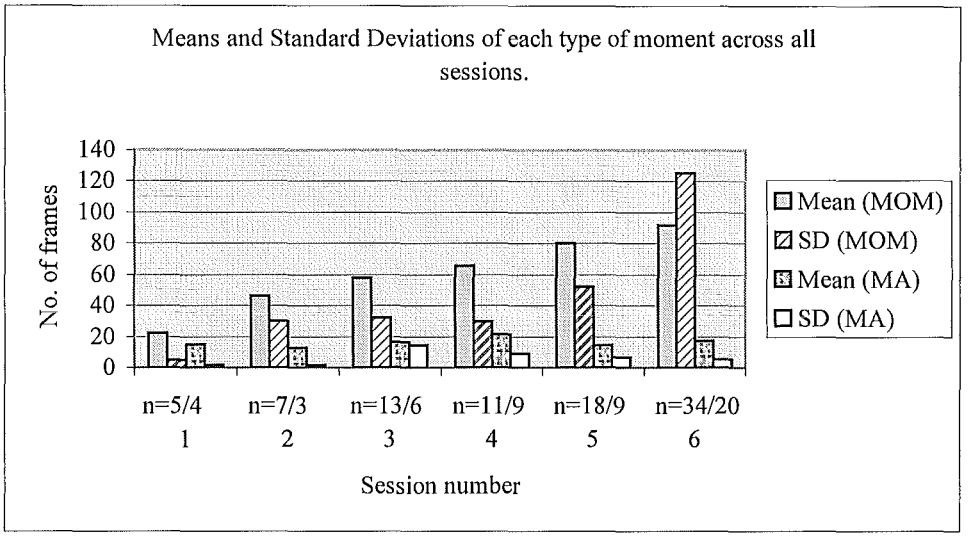


Figure 13 Means and standard deviations of each type of moment across all sessions

Figure 13 shows an increase in the mean no. of frames of MOM's across all sessions. In addition to this with the exception of session 4 there is an increase in the number of MOM's recorded. Of particular interest is the increase from 18 MOM's to 34 MOM's in sessions 5 and 6 respectively. Whilst the length of engagements was clearly longer (as suggested by the mean increase), the clear jump in number of MOM's did not result in a corresponding shift in mean no. of frames at session 6. Indeed the *sd* at session 6 is higher than the mean no. of frames. This result was due to an outlier in this session.

By contrast the mean no. of frames for MA moments across the session did not rise above 21.5 frames (session 4). Whilst there was no clear pattern to the means of MA moments they are all clearly below the mean no. of frames for MOM's. It is important to report that figure 13 shows that the *sd's* for the MA moments show a decrease from session 3 to 6, suggesting that there is a decrease in the variance around the means for MA moments as the number of sessions increased.

The behavioural accompaniments to these findings are presented below.

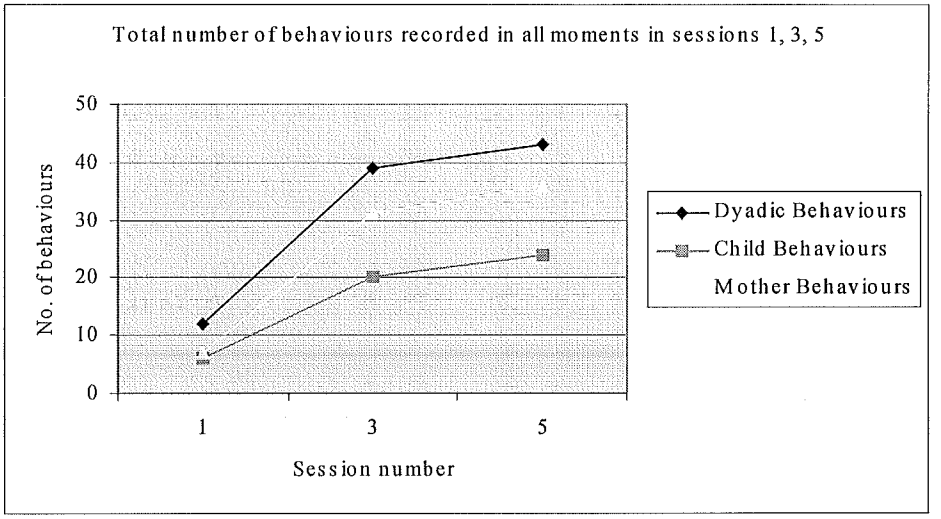


Figure 14 Total number of behaviours recorded in each category across sessions 1, 3, and 5.

Figure 14 shows the unique configuration of the number of behavioural displays embedded in the moments recorded for this dyad. There is a linear relationship between all categories of behaviours all following a similar direction. The mothers behaviours are greater in number than child's which in turn are lower than the dyadic behaviours noted. The relatively low numbers in the first session must be interpreted with caution (see discussion). However if these data are interpreted in light of the data in Fig. 13, it can be seen that the dyad did interact for longer and more often across these three sessions. As the scatter plots will show however clustering of moments means that these patterns may be context specific.

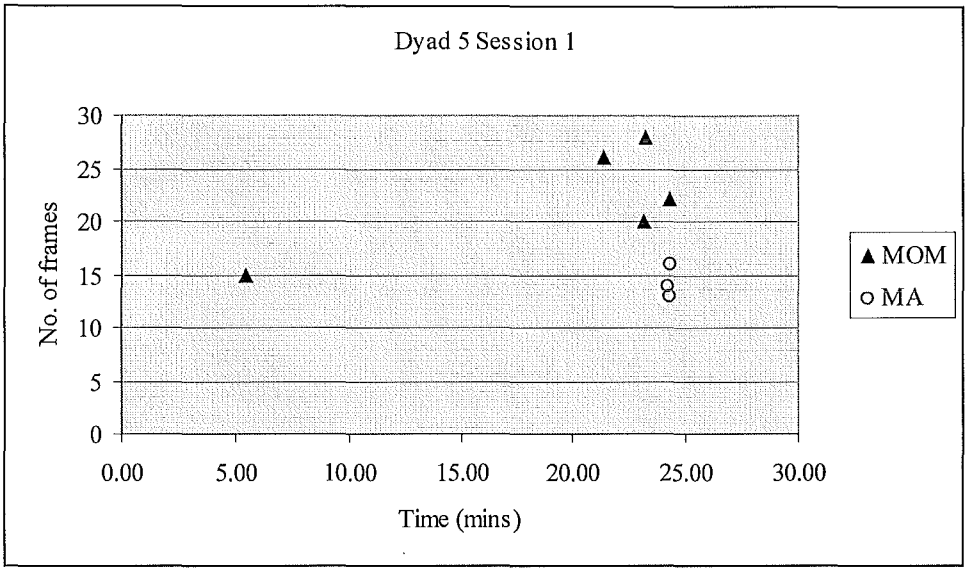


Figure 15a The distribution of both types of moment across session 1.

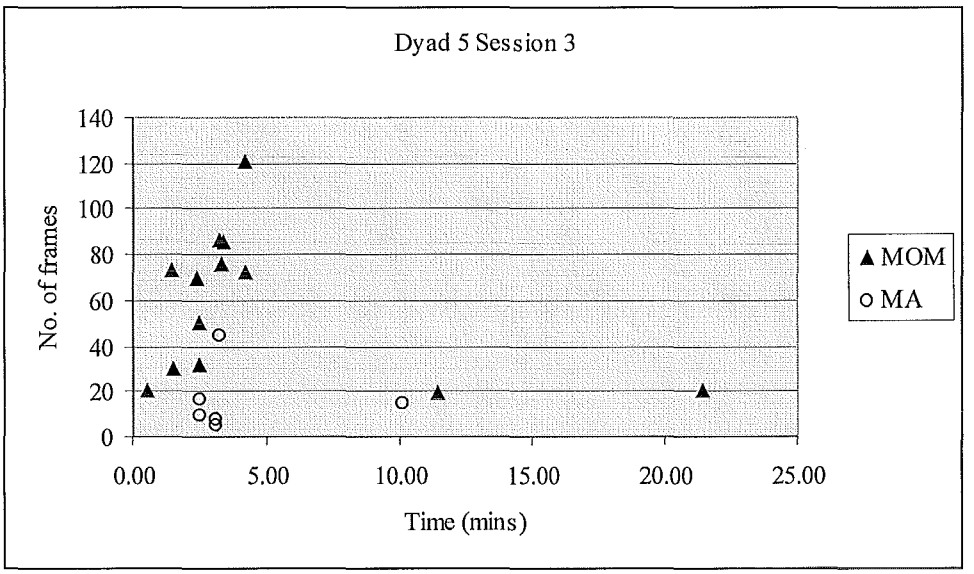


Figure 15b The distribution of both types of moment across session 3.

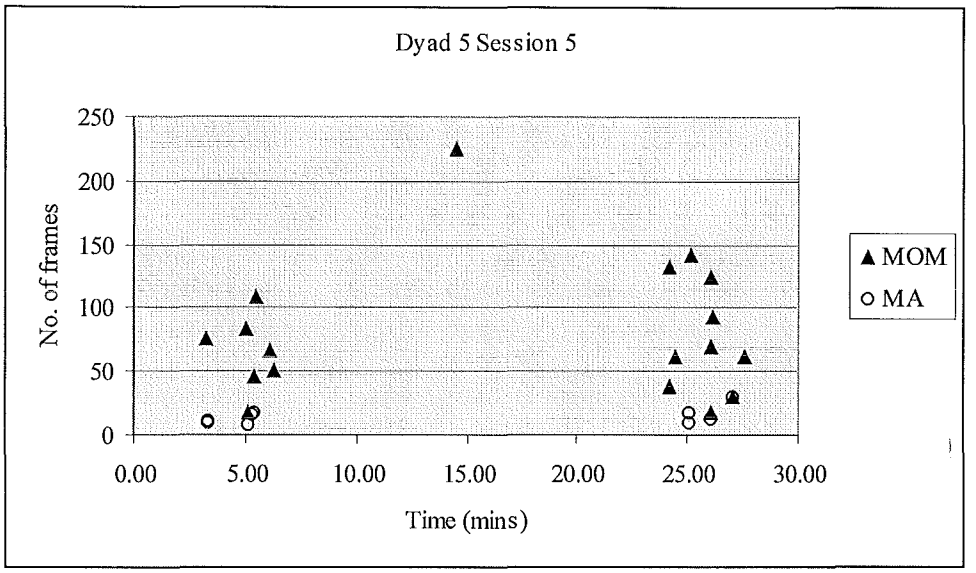


Figure 15c The distribution of both types of moment across session 5.

Figures 15a –15c show patterns of distribution of moments that become embedded in the type of data represented in figure 13. Several interesting features emerge from these scatter plots. Firstly it is clear to see the increase in the size (no. of frames) of MOM's across the three sessions. Secondly there appears to be a pattern of clustering of MOM's at particular points in the sessions. For session 1 this appears to be at the end of the session, for session 3 at the beginning and at session 5 the beginning and the end. It is also of interest that MA moments are also clustered closely around the MOM's. This is true for all sessions. In addition to this the low variability of the MA moments as indicated by the low standard deviations in figure 13, is supported by the size of the MA moments particularly at session 5. Two outliers are obvious in sessions 3 and 5, and large gaps in moments of engagement in all three sessions are clear from the illustrations.

Dyad 5 display a unique pattern of engagement as indicated by the two types of moments. MOM exist in tandem with MA moments with a distinct lack of spread of either moment across sessions.

CASE SIX: Dyad 6

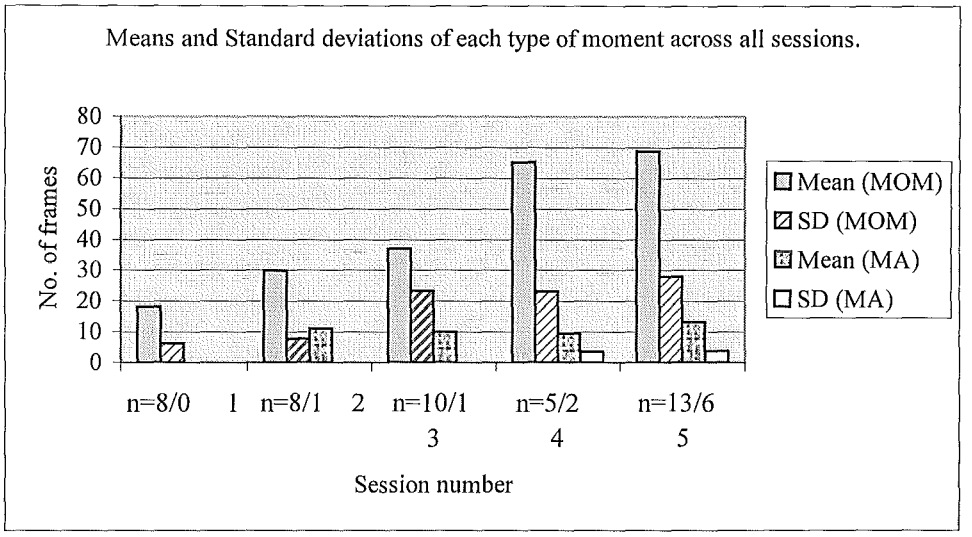


Figure 16 Means and standard deviations of each type of moment across all sessions. The number of each type of moment is recorded as "n" in each session with MOM the first number and MA the second.

Figure 16 shows that the mean no. of frames of MOM for Dyad 6 increased from session 1 through to session 5. Given that there were only 5 moments recorded at session 4 suggests that these moments must have been considerably larger than the 10 moments recorded in session 3. The relatively low *sd's* around the means for MOM's in session 4 and 5 suggests less variance around the mean than in session 3 for example. Apart from session 4, there is a clear increase in the number of MOM across the other sessions. Thus there are more examples of engagement that last for longer periods of time as the number of sessions increase.

The number of MA moments also show an increase across sessions, however the mean no. of frames for this type of moment remained well below that of MOM's in the same session. Indeed the mean no. of frames for MA's for this dyad remained below 20 frames. This level of consistency is clearly seen in figure 16. Only two standard deviations were plotted due to the fact that in three out of the five sessions there were either none or one MA moment. The lack of MA moments in early sessions is unique to Dyad 6 and must be interpreted in light of the fact that the highest mean frame duration of MOM was recorded at session 5 (68.69 see Appendix D). This was low in comparison to other dyads and equates to only just under 3 seconds of interaction.

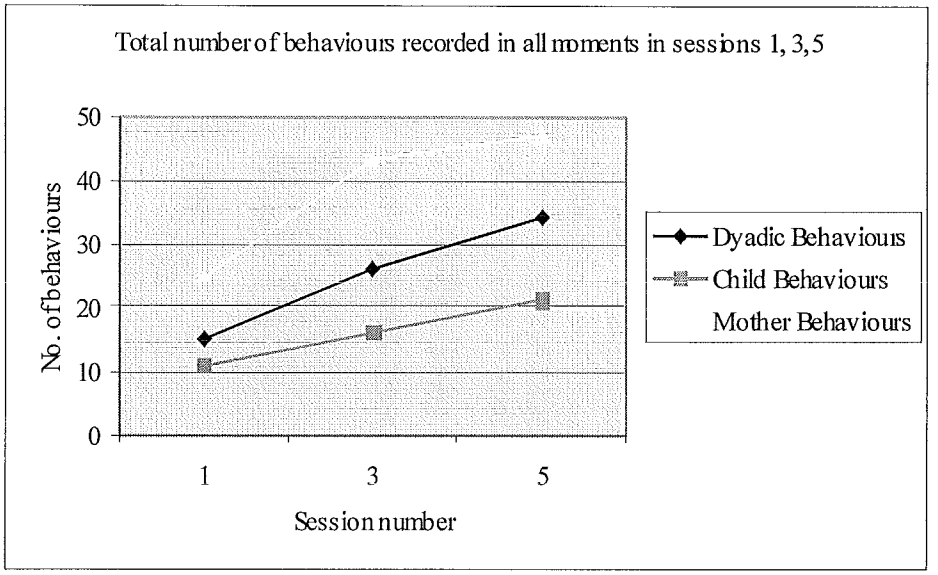


Figure 17 Total number of behaviours recorded in each category across sessions 1, 3, & 5.

Figure 17 shows clearly the high number of maternal behaviours recorded relative to dyadic and child behaviours. The behaviours displayed by the child whilst growing in numbers across sessions, has a more shallow incline compared to the pattern of dyadic behaviours and must be viewed within the context of data contained in Fig. 16. Here the low moment numbers and mean frame duration have a direct bearing on the fact that the increase in behaviours recorded (11 at session 1 and 21 at session 5). The opportunities for connection were smaller in length and number so it is hardly surprising that a small range is observed for this child. The mother by comparison exhibits a wide range of interactive behaviours (see Appendix F) indicating her ability to draw on a broad range of behaviours to bring the child into connected moments. How these are enacted in real time is represented in figures 18a – c.

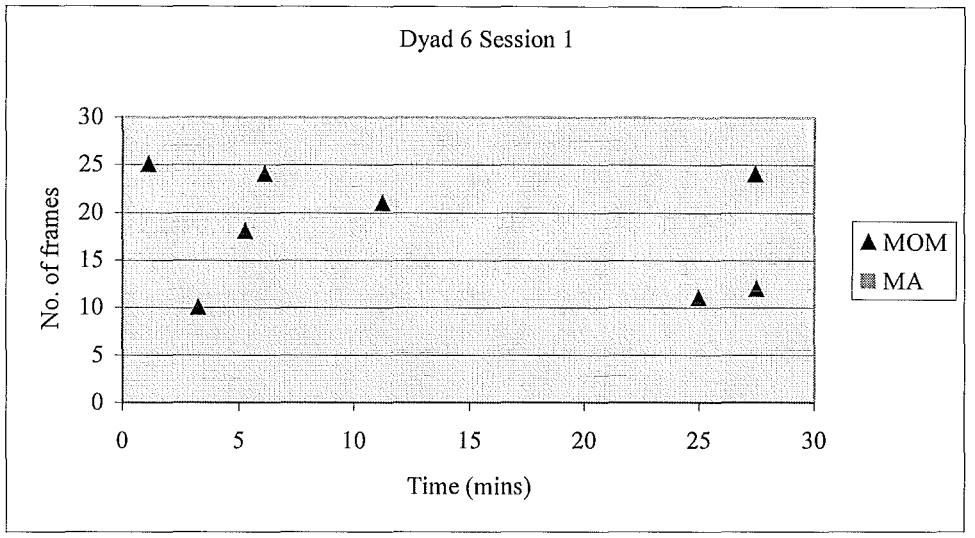


Figure 18a The distribution of each type of moment across session 1.

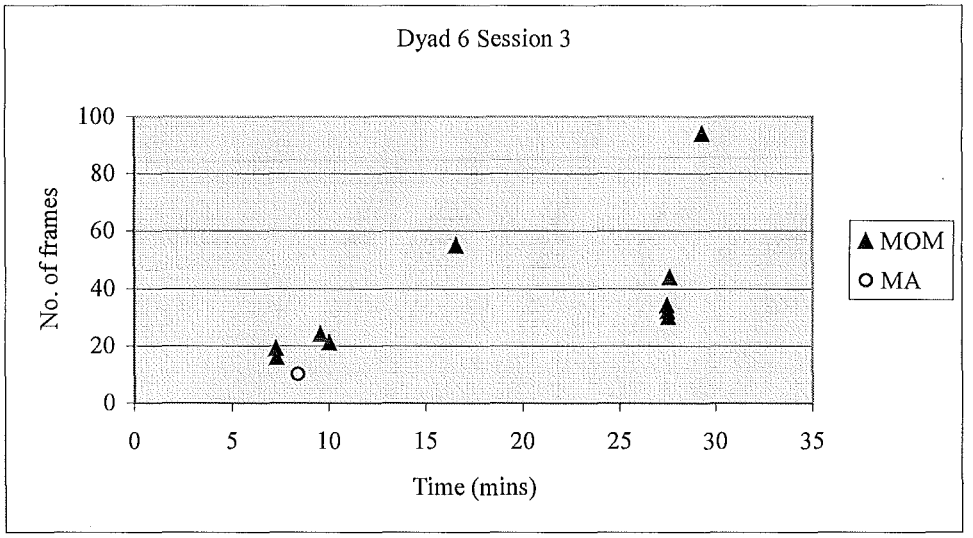


Figure 18b The distribution of each type of moment across session 3.

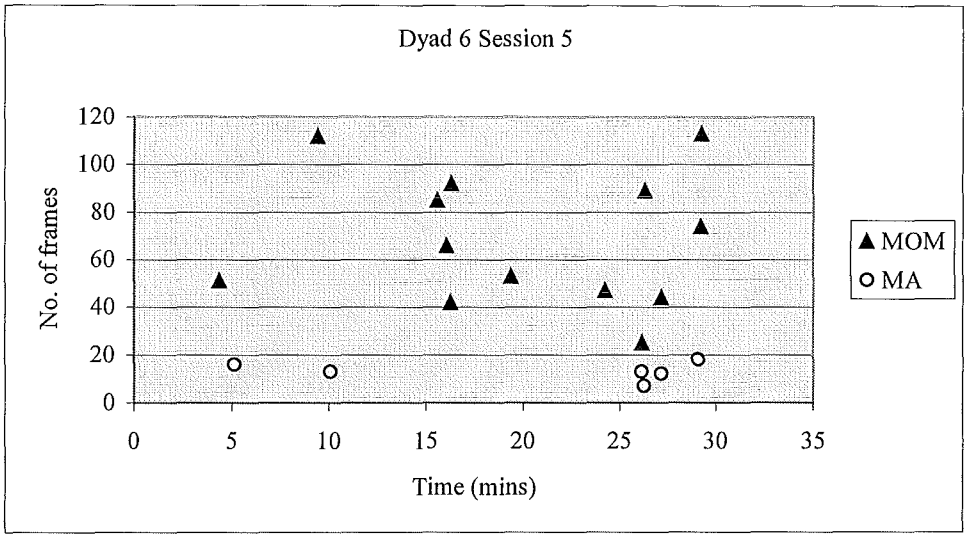


Figure 18c The distribution of each type of moment across session 5.

Figures 18a –18c show an increase in the size of MOM's (as measured by the number of frames), across the three sessions. Interestingly the largest moment recorded in session 1 was 25 frames long, which equates to a second of interaction. That the rest of the moments are below this mark shows that moments of engagement in session 1 are in parts of seconds. These moments are loosely clustered at the beginning and end of session 1, similarly scattered in session 3 (with the exception of one MOM in the sixteenth minute), and more widely spread across session 5.

MA moments in comparison do not feature in session 1. In session 3 a single moment is situated around a group of MOM's and in session 5 there is a clustering of 4 MA moments (out of a session total of 6) around 6 MOM's (just over 46% of all the MOM's for that session). In sessions 3 and 5 the MA moments were all smaller in size (no. of frames) than any of the MOM's.

The patterns described suggest that there is increased interactive activity where the clustering occurs. The amount of "checking in" behaviour as indicated by MA moments increases as the number of MOM does.

Results of Analysis of Variance (ANOVA)

A three-way analysis of variance (Dyad x Session x Type of Moment) was conducted to test for between subject effects (see Appendix E). The results yielded a significant main effect of Type of Moment, F (1, 6.759) = 9.657, $p < .018$, indicating that the number of Moments of Meeting were significantly greater than Moving Along moments across sessions.

This effect must however be interpreted in light of the significant Session X Type of Moment interaction F (5, 24.195) = 4.887, $p < .003$. Thus there is a statistically significant difference between the size of MOM's compared to MA moments with an increasing number of DIT sessions.

This interaction is expressed as the increasing divergence between the mean number of frames of MOM's and MA moments with increasing number of therapy sessions, and has been graphically supported by the histograms and scatter plots for each of the dyads.

Summary

The results have been presented dyadically and for the group as a whole. The results of single-case studies has revealed unique patterns for each of the dyads which would not have been identified without the analyses offered. This is seen in the variation in the amount of time spent in Moments of Meeting and Moving Along moments, variation in the distribution of interactive episodes in therapy sessions and unique patterns of behavioural accompaniments to the moments of engagements.

It is clear from the results that the mean frame duration of Moments of Meeting increased for each of the dyads over time. However while the direction was the same, clearly the extent of this direction was not. For example the results (see Appendix D) show that the mean frame durations of MOM's for Dyad 1 were 21.75 and 290.5 at sessions 1 and 5 respectively. By comparison the mean frame durations of MOM's for Dyad 3 were 15 and 48.5278 at sessions 1 and 5 respectively. The comparative differences between the means, suggests greater change in time of engagement for Dyad 1 than Dyad 3. However this type of comparison is perhaps more relevant to an evaluation of the efficacy of therapy which is outside the scope of this thesis. Nonetheless such differences attest to the unique therapeutic journey each dyad has traversed. Dyads 1, 2, 3, and 4 all show that by session 5 the number and size of the moments are spread throughout the session. The spread of moments across sessions was more weakly represented for Dyad 6 and not strongly

indicated in the data for Dyad 5. Interestingly this child was the oldest child at entry into DIT, and his time in therapeutic intervention was of a lesser amount than all but one of the other Dyads.

The number of MA moments showed a general increase from session 1 to 5/6 in three of the dyads (1, 5, 6), showed stability in Dyads 2 and 4, and no obvious pattern in Dyad 3. Whilst no pattern was anticipated by the hypotheses these findings emerge when the data are examined closely (see Appendix D).

Clustering of MA moments around MOM was evident for all of the dyads suggesting a relationship between the two variables, although their numbers did not necessarily predict the time spent in the interactions.

In addition to this the results showed that for five out of the six dyads the mothers behavioural displays were greater in number than the child's even though both evidenced increased numbers of behavioural repertoires over time. Particular patterns emerged for dyads and these were related to the mean number of moments and mean length of time spent in engagement episodes. Dyadic behaviours by comparison increased for all dyads over the three sessions examined.

An interesting outcome of the methodology of this thesis not predicted by the hypotheses and not indicated by the data analyses, was that within the enactment of dyadic exchanges lay unique patterns of responding and connecting as measured by the frames of each moment *and* the frames in between. The timing of these exchanges appeared to be uniquely configured and dyad specific (see discussion for current research).

Chapter Four

DISCUSSION

Given the small sample size and the heterogeneous nature of the children in the population, the results must be interpreted with caution. This is further complicated by the fact that there is not yet a body of literature examining the particular constructs upon which this research was based. In drawing conclusions one must return to the theoretical foundations of early interactive development outlined in the introduction and extrapolate meaning from this for the current study. Only then can connections be made and implications suggested.

One of the main aims of this thesis was to explore the utility of Moments of Meeting and Moving Along moments as markers of the quality of shared interactional experiences between children with an ASD and their mothers. It was hypothesised that the size and number of moments would increase over sessions of DIT. The results confirmed that with increasing sessions of DIT the mean amount of time spent in dyadic interactions increased for all of the dyads. Whilst the number of MOM's and MA moments did not predict the size of the interactions (there was a clear drop in the number of MOM's for five out of the six dyads from session three to four), the longitudinal data revealed that the mean time spent in connected moments (as measured by frames) increased for all of the dyads regardless of how long they spent in therapy. As expected given the unique qualities of each dyad, the size of this direction varied from one dyad to another. Corresponding rises in standard deviations around these means need not be interpreted with alarm. A high degree of variability was not unexpected given that the course of most social interactions cannot be held to be static or demonstrate uniformity with respect to size and content. As the Boston Study Group suggests (1998) and the transformational model attests (Sameroff & Chandler, 1975), the progress of interactions is largely unconducted and unplanned. Rather they are made up of a set of moving semantic and pragmatic rules of how to "be" with another. This implies that interactive exchanges cannot be orchestrated but are contextual responses to internal and external motivating forces. Thus moments of connection will not only vary in number but also in duration as the results indicate.

This last point is borne out by the characterisation of the internal mechanics of the sessions as shown in the scatter plots for each dyad. The spread of moments across later therapy sessions, combined with the clustering of MA moments around MOM's is a fundamental

finding to this thesis because it suggests interactional growth for dyads. The increased number of engagements seized, the ability to engage for longer and at more regular intervals strongly suggests a level of intentionality with regard to communicative responsiveness of the child and the dyad. To engage in such moments suggests the child is able to apprehend the significance of the emotionally laden information signals of the mother and apprehend how these can be affected, corroborated or changed. The behavioural accompaniments to these moments, particularly the demonstrated increases in affect match, eye contact, mutual smiling and physical contact, support this tenet and further suggest a change in complexity of later interactive exchanges.

The discussion thus far provides evidence that the construct of Moments of Meeting is sensitive to the intimate exchanges of two person interactions over time and in shorter subjective units of time. The consideration of the response patterns of both partners in naturally enacted sequences has been held to further the understanding of the development of social interactions (Walden & Knieps, 1996). Other authors have suggested that longitudinal research needs to examine the relationship between mutual regulatory forces operating in early face to face interactions with the self-regulatory capacities of children which typically appear in the second half of the first year of life (Feldman, Greenbaum & Yirmiya, 1999). Whilst highly speculative one feature of this thesis may offer information relevant to this possibility.

It will be remembered from the results that MA moments were significantly different in size compared to MOM and that this effect was found to occur as the number of therapy sessions increased. Given the definition of a MA moment, its relationship to the Moving Along period propounded by Stern (1998), and the intimate links drawn between MA moments and social referencing skills, it is possible to see the interaction effect as signaling an emergence of self regulatory abilities in the children. All dyads showed an increase in number of MA moments from session 1 to session 5/6, with three demonstrating overall increase across therapy sessions. The literature points to the emergence of social referencing skills in the second half of the first year of life (Feinman, 1982; Walden & Ogan, 1988), and holds that these skills only emerge after shared emotional experiences become part of the child's relational knowing of what it is like to "be" with another (Hobson, 1993). Importantly this suggests that the brief "checking in" behaviours (MA moments) affirm the child's place in the Moving Along period through the use of referent clues of the mother's facial expressions. The course of the interaction of the Moving Along period is not altered and goal relevance remains central. The MA moment scaffolds the

child's present so that it may be connected to past interactive history and forms part of future opportunities for connection.

The crucial point to make here is that these interactive moments (measured in seconds and microseconds) herald the perception of coordinated actions for each partner relative to the other. This could be more clearly stated as a developing sense of self-awareness and self in relation to other (Bruner, 1975). This growing sense of self gains momentum within co-regulated experiences with the mother and is displayed as self regulatory capacities established as the child develops agency over the content and form of the intimate experiences. Biological foundations for this process have been indicated in the development of the corticolimbic system through the imprinting of visual-affective information through synchronous acts of engagement (Schore, 1996). Links with frontal lobe development and ties to later emotion regulation are implicated here.

This is of particular interest to this thesis because it supports the concept of "mutual mapping" embodied in the theoretical constructs guiding this study. Mutual mapping suggests changes in the brain organization of each member of the dyad as they engage in moments of meeting. Whilst no biological or physiological data were examined in this thesis the results of this study with particular reference to the increase in duration and frequency of MOM, given the previous discussion, would imply improved mutual mapping for each dyad over time.

The fundamental outcome of all of this is a shift in the implicit relational knowing which heralds "new-ways-of-being-with-the-other" (Lyons-Ruth, 1998).

Another point of significance was the mother's behaviours expressed during both types of moments. In all but one dyad they were greater in number than that of the child's, and in this dyad there was a similar amount of responding present. The issue here is one of scaffolding. It seems reasonable to assert that higher rates of responding by the mother is a likely index of the mother's attempts to scaffold the interactive environment for the child. It has been reported that mother's of children with an ASD show fewer engagement patterns with their children (Kasari & Sigman, 1996). This was not supported by the results of this study although lower rates of responding were certainly a feature of the first sessions. It is important to acknowledge at this point however that the first sessions of DIT were unfamiliar arenas for all participants (including therapists). The sessions however do

represent a consistent feature of the research data and as such the earliest time frame in which interactive patterns can be quantified.

If behavioural indices of interactions are possible indicators of the scaffolding mechanics at work then the clustering of both types of moments found in this study may add further support to this tenet. The clustering suggests a high level of "interactive content" with the MA moments mediating a number of MOM's for the dyad. Whilst highly speculative this would be intimately tied to the notion that social referencing abilities herald improvement in regulatory capacities (Klinnert, Emde, Butterfield & Campos, 1986), not only for each member of the dyad but also with respect to how dyadic regulation is represented by both partners. In this context MA's are the tools through which the interactive space between significant events can be held and supported.

As suggested by the literature the conditions that must be met for this to occur – history of regulated affectual experiences and clear reciprocal interactions - are represented by the results of this study. The history can be seen in the examination of interactions over time and are further qualified by the variation in the ways these are expressed. Both behavioural factors and the expression of connections in real time or as they occur add weight to this view.

Reduced imitation and initiation skills (in particular smiling and cooperative play initiators) in earlier sessions found in the children in this study reflects other findings in the literature (Mundy et al, 1986). As these authors suggest this finding signals the difficulties the child with an ASD has in coordinating events with another. Both imitation and initiation not only signal an awareness of self in relation to other, but are crucial for coordinating dyadic interactive sequences. Their presence in larger numbers in later sessions is perhaps further evidence for improvement in the quality of relationship and regulatory capacities of the child, but their relatively low numbers in comparison to other behaviours, suggest a fragility in the ability to use these skills. Imitation and initiation give information regarding intent and encourage turn taking skills and whilst turn taking skills were not measured in this study it would be of value to do so. These data could then be viewed in light of the other corrollories of self regulation – social referencing – mentioned earlier.

This thesis points to other findings as to the usefulness of retrospective video analysis in research (Baranek, 1999). Whilst it was necessary control for such things as order effects, it

would be difficult to accurately describe the quality of interactive experiences without clear baseline data. Nonetheless the study is not without limitations.

The therapy surrounding the interactive exchanges measured is both dyad and context specific. Indeed the content of the therapy could provide a crucial window into how the configuration of activities encouraged interactive opportunities. Whilst this suggested the experimental design it makes generalisation of findings to other populations more problematic. In addition this makes the application of operational definitions more open to subjective criticism. With this in mind it is important to remember that one of the components of the rationale surrounding this thesis was to examine the attendant features of interactions as they were expressed in real time. This study not only suggests a new operational framework through which the development of social interactions can be viewed, but also supports a call for convergent data on the outcomes of the facilitation of social interactive skills (Hobson & Lee, 1998; Tardif, Plumet, Beaudichon, Walter, Bouvard & Leboyar, 1995), for children with an ASD.

Other shortcomings of this study were the technical difficulties associated with video viewing. Tapes regularly did not wind back to the required place and the manual counting of interactive moments, while unilaterally applied across subjects suggests that accuracy could be compromised. Computer generated methods would have been preferable. In a related vein clarity of videos was at times compromised by movement by the original vidoer which at times made assessment of the start and finish of a moment of connection difficult. When doubt was expressed the moment could not be counted.

Of particular interest to this author was the emerging fact that the temporal quality of the interactions were dyad specific and consistent over time. This appears to fit neatly with contingency explanations as to the nature of emerging properties of the development of protoconversation in infants and young children (Rochat et al 1999a), and implicates the "something more" suggested by the Boston Study Group (1998). Given that moments were identified in microseconds and half seconds suggests an element of "unconscious awareness of another" that in real time is barely recognizable but when slowed is clearly visible. Research for the implications of this highly speculative postulate is warranted and moves beyond the population of this thesis. If indeed there is an interpersonal timing not obvious in observational research, then methodology must be created to explore its relevance to interactional development and relative use to clinical populations.

There can be no one definitive answer to the nature of human interactions. Data can only converge on premises that when faced with differences or concerns indicate the facilitation of improved outcomes. For children with an ASD aspects of their emotional life have been shown to be compromised (Hobson, 1993). This study indicates as others have that children with an ASD do make interactive bids (Tardif et al 1995), and of greater interest clinically, that these can be facilitated to enhance the primary relationship of which the children are a part. Yet there is some way to go however before the optimal conditions for interactive change can be suggested. At the very least an appropriate amount of scaffolding both environmental and emotional seems to be indicated to influence the nature of these interactive difficulties. This in turn implies a multifaceted approach to the question and returns the reader to the theses which opened the introduction of this paper.

Whilst no specific outcome data were offered as part of the analysis of this thesis, it is interesting to note that of the children who entered DIT who were nonverbal (n=4), three were verbal and/or using a PECS system (Picture Exchange Card System) at time of exit from the Champion Centre. The fourth was using non-verbal gestures and some pictures to indicate choice and need and the fifth child was verbal on entry. This thesis does not purport to provide an evaluation of DIT, but does provide a platform for a full analysis of its efficacy.

Human interactive experience is a constantly changing playground offering opportunities to explore, discover and experience. It is all the richer if it is explored with another. It is the other who communicates the "yes" of the here and now and it is in this knowing that future opportunities for connection can be recognised and shared. If one turns and looks, and finds another waiting, then the expectation of finding that person again is revealed in the next moment. The narrative of this experience becomes the platform of an individual's preparedness to enter the "shareable universe", and is the "how to" of emotional experience.

REFERENCES

Adamson, L.B., & Russell, C.L. (1996). Emotion Regulation and the Emergence of Joint Attention. In P Rochat (Ed.), *Infant Social Cognition,* 281-297. Hillsdale, NJ: Erlbaum.

Ainsworth, M.D.S. (1973). The development of infant-mother attachment. In B. Caldwell & H. Ricciuti (Eds.), *Review of child development research* (Vol. 3). Chicago: Universtiy of Chicago Press.

Ainsworth, M.D.S., Blehar, M., Waters, E., & Wall, S. (1978). *Patterns of Attachment.* Hillsdale, NJ. Erlbaum.

Attwood, A., Frith, U., & Hermelin, B. (1988). The understanding and use of interpersonal gestures by Autistic and Down Syndrome children. *Journal of Autism and Developmental Disorders, 18,* 241-257.

Baltes, P.B. (1987). Theoretical propositions of life span developmental psychology: On the dynamics of growth and decline. *Developmental Psychology, 23,* 611-626.

Bandura, A., & Walters, R.H. (1963). *Social learning and personality development.* New York: Holt, Rinehart & Winston.

Baranek, G.T. (1999). Autism During Infancy: A Retrospective Video Analysis of Sensory-Motor and Social Behaviours at 9-12 Months of Age. *Journal of Autism and Developmental Disorders, 29,* (3), 213-224.

Barnard, K.E., & Kelly, J.F. (1990). Assessment of parent-child interaction. In S.J. Meisels, & J.P. Shonkoff (Eds.), *Handbook of Early Childhood Intervention* (278-302). Cambridge University Press.

Baron-Cohen, S., Leslie, A.M., & Frith, U. (1985). Does the autistic child have a "theory of mind?" *Cognition, 21,* 37-46.

Beebe, B., Lachmann, F., & Jaffe, J. (1997). Mother-Infant Interaction Structures and Presymbolic Self- and Object Representations. *Psychoanalytic Dialogues, 7, (2)*: 133 – 182.

Bowlby, J. (1969). *Attachment and loss: Vol. 1 Attachment.* New York: Basic Books.

Bowlby, J. (1973). *Attachment and Loss.* Vol. 2, *Separation, Anxiety and Anger.* New York: Basic Books.

Bowlby, J. (1980). *Attachment and Loss:* Vol. 3, *Loss: Sadness and depression.* New York: Basic Books.

Braungart, J.M., & Stifter, C.A. (1991). Regulation of negative reactivity in the strange

situation. Temperament and attachment in 12 month old infants. *Infant Behavior and Development, 14,* 349-364.

Brazelton, T.B., & Yogman, M.W. (1986). Introduction: Reciprocity, Attachment, and Effectance: Anlage in Early Infancy. In T.B. Brazelton and M.W. Yogman (Eds.), *Affective Development in Infancy.* Ablex Publishing Co.

Bronfenbrenner, U. & Ceci, S.J. (1994). Nature – Nurture Reconceptualised in Developmental Perspective: A Bioecological Model. *Psychological Review, Vol. 101, No. 4, 568-586.*

Bronfenbrenner, U. (1979). *The ecology of human development.* Cambridge, MA: Harvard University Press.

Bruner, J. (1975). From communication to language – a psychological perspective. *Cognition, 3,* 255-287.

Bruner, J. (1981). Learning how to do things with words. In J. Bruner & A. Garton (Eds.), *Human Growth and Development,* 62-84. London, UK: Oxford University Press.

Campos, J.J., Barrett, K.C., Lamb, M.E., Goldsmith, H.H., & Stenberg, (1983). Socioemotional Development. In M.M Haith and J.J Campos (Eds.) *Handbook of Child Psychology.* Vol. 2, *Infancy and Developmental Psychobiology.* New York: Wiley Press.

Campos, J.J., Campos, R.G., & Barrett, K.C. (1989). Emergent themes in the study of emotional development and emotion regulation. *Developmental psychology, 25,* 394-402.

Camras, L. (1992). Expressive development and Basic Emotions. *Cognition and Emotion, **6**, 3-4,* 269-283.

Caplovitz-Barrett, K., Campos, J.J., & Emde, R.N. (1996). Infant's Use of Conflicting Emotion Signals. *Cognition and Emotion, 10,* (2), 113-135.

Cassidy, J. (1989). Child-mother attachment and the self at age six. *Child Development, 57,* 331-337.

Cohn, J.F., Campbell, S.B., & Ross, (1992). Infant response in the still-face paradigm at 6 months predicts avoidant and secure attachment at 12 months. *Development and Psychopathology, **3**,* 367-376.

Crockenberg, S.B., & Smith, P. (1982). Antecedents of mother-infant interaction and infant irritability in the first three months of life. *Infant Behavior and Development, 5,* 105-119.

Dawson, G., Hill, D., Spencer, A., Galpert, L., & Watson, L. (1990). Affective exchanges between young autistic children and their mothers. *Journal of Abnormal Child Psychology, 18,* 335-345.

Dunn, J. (1994). Experience and Understanding of Emotions, Relationships and Membership in a Particular Culture. In P. Ekman and R. Davidson (Eds.). *The nature of*

emotion: fundamental questions. Oxford University Press: New York.

Ekman, P. & Freisen, W.V. (1971). Constants across cultures in the face and emotion. *Journal of Personality and Social Psychology, 17, 124-129.*

Ekman, P. (1992). Facial Expression and Emotion. *American Psychologist, 48, 384-392.*

Feinman, S. (1982). Social referencing in infancy. *Merrill-Palmer Quarterly, 28,* 445-470.

Feldman, R., Greenbaum, C.W., & Yirmiya, N. (1999). Mother-Infant Affect Synchrony as an Antecedent of the Emergence of Self-Control. *Development Psychology, 35,* (5), 223-231.

Field, T. (1984). Early interactions between infants and their post-partum depressed mothers. *Infant Behavior and Development, 7,* 517-523.

Fogel, A. (1992a). Movement and communication in infancy: The social dynamics of development. *Human Movement Science, 11,* 505 – 523.

Frith, U. (1993). Autism. *Scientific American, 286,* (6), 78-84.

Gianino, A., & Tronick, E.Z. (1988). The mutual regulation model: the infants' self and interactive regulation, coping, and defense. In T. Field, P. McCabe, & N. Schneiderman (Eds.), *Stress and Coping,* 47-68. Hillsdale, NJ: Erlbaum.

Goldberg, S. (1977). Social competence in infancy: A model of parent-infant interaction. *Merrill-Palmer Quarterly, 28,* 163-177.

Goldberg, S., MacKay-Soroka, S., & Rochester, M. (1994). *Infant Behavior and Development, 17,* 335-339.

Greenspan, S.I. (1992). *Infancy and Early Childhood: The Practice of Clinical Assessment and Intervention with Emotional and Developmental Challenges.* Madison, Conn.: International Universities Press.

Greenspan, S.I. (1997) *The Growth of the Mind and the Endangered Origins of Intelligence.* Perseus Books.

Greenspan, S.I., & Weider, S. (1998). *The Child with Special Needs: Encouraging Intellectual and Emotional Growth.* Addison-Wesley Longman Inc.

Happe, F., & Frith, U. (1994). Autism: Beyond "theory of mind". *Cognition, 50,* 115-132.

Haviland, J.J., & Lelwica, M. (1987). The induced affect response: 10-week-old-infant's responses to three emotion expressions. *Developmental Psychology, 23,* 97-104.

Hobson, R.P. (1993). The emotional origins of social understanding. *Philosophical Psychology, 6, (3),* 227-249.

Hobson, R.P., Ouston, J., & Lee, A. (1988a). What's in a face? The Case of Autism. *British Journal of Psychology, 79,* 441-453.

Huebner, R.R, & Izard, C.E. (1988). Mothers' responses to infants facial expressions of sadness, anger and physical distress. *Motivation and Emotion, 12, (2),* 185-196.

Hwang, B., & Hughes, C. (2000). The Effects of Social Interactive Training on Early Social Communicative Skills of Children with Autism. *Journal of Autism and Developmental Disorders, 30,* (4), 331-343.

Isabella, R.A., & Belsky, J. (1991). Interactional synchrony and the origins of infant-mother attachment: A replication study. *Child Development, 62,* 373-384.

Izard, C.E. & Malatesta, C. (1987). Perspectives on emotional development: 1, Differential Emotions Theory of early emotional development. In J.D. Osofsky (Ed.), *Handbook in Infant Development,* 2nd edn. New York: Wiley, 494-554.

Izard, C.E. & Malatesta, C. (1987). Perspectives on emotional development: 1, Differential Emotions Theory of early emotional development. In J.D. Osofsky (Ed.), *Handbook in Infant Development,* 2nd edn. New York: Wiley, 494-554.

Izard, C.E. (1971). *The face of emotion,* New York: Appleton-Century Crofts.

Izard, C.E. (1977). *Human Emotions.* Plenum.

Izard, C.E. (1991). *The psychology of emotions.* Plenum.

Izard, C.E. (1994). Intersystem Connections. In P. Ekman & R.J Davidson (Eds.). *The nature of Emotion: fundamental questions.* Oxford University Press: New York, 356-361.

Izard, C.E., Fantauzzo, C.A., Castle, J.M., Haynes, O.M., Rayias, M.F., & Putnam, P.H. (1995). The Ontogeny and Significance of Infants' Facial Expressions in the First 9 Months of Life. *Developmental Psychology, 31, 6,* 997-1013.

Izard, C.E., Haynes, O.M., Chisholm, G., & Baak, K. (1991). Emotional Determinants of Infant-Mother Attachment. *Child Development, 62,* 906-917.

Kanner, L. (1943). Autistic Disturbances of Affective Contact. *Nervous Child, 2,* 217-250.

Kasari, C., & Sigman, M. (1996). Expression and Understanding of emotion in Atypical Development: Autism and Down Syndrome. In M.Lewis and M.W. Sullivan (Eds), *Emotional Development in Atypical Children,* Lawrence Erlbaum Associates, N.J. 109-130.

Kasari, C., Sigman, M., Mundy, P., & Yirmiya, N. (1990). Affective sharing in the context of joint attention interactions. *Journal of Autism and Developmental Disorders, 20,* 87-100.

Klinnert, M., Emde, R., Butterfield, P., & Campos, J.J. (1986). Social referencing. *Developmental Psychology, 22,* 427-432.

Kogan, N., & Carter, A. (1996). Mother-Infant Reengagement following the Still-Face: The Role of Maternal Availability in Infant Affect Regulation. *Infant Behaviour and Development, 19,* 359-370.

Lewis M., & Michalson, L. (1983). *Children's emotions and* moods*: Developmental Theory and Measurement.* New York: Academic Press.

Lewis, M. & Sullivan, M.W. (1996) The Role of Situation and Child Status on Emotional Interaction, In M. Lewis and M.W. Sullivan (Eds), *Emotional Development in Atypical Children.* Lawrence Erlbaum Associates, 43-63.

Lewis, M. (1992). *Shame, The Exposed Self.* New York: Free Press.

Lewis, M. (1993). Self conscious emotions: Embarrassment, pride, shame and guilt. In M. Lewis and J.M. Haviland (Eds), *Handbook of Emotions.* New York: The Guilford Press, 563-574.

Lewis, M., & Brooks, J. (1978), Self-Knowledge and Emotional Development. In M. Lewis and L. H. Rosenblum (Eds), *The Development of Affect.* New York: Plenum Press.

Lundy, B., Field, T., & Pickens, J. (1996). Newborns of Mothers with Depressive Symptoms are Less Expressive. *Infant Behavior and Development, 19,* 419-424.

Lyons-Ruth, K. (1998). Implicit Relational Knowing: Its Role In Development and Psychoanalytic Treatment. *Infant Mental Health Journal, 19, (3),* 282-289.

Lyons-Ruth, K., & Zeanah, C.H. (1993). The Family Context of Infant Mental Health: I. Affective Development in the Primary Caregiving Relationship. In C.H. Zeanah Jr (Ed.), *Handbook Of Infant Mental Health.* New York: The Guilford Press.

Magai, C. & Hunziker, J. (1993). Tolstoy and the riddle of developmental transformation: A lifespan analysis of the role emotions in personality development. In M. Lewis and J.M. Haviland (Eds.), *Handbook of Emotions.* New York: The Guilford Press, 247-260.

Mahler, M.S., Pine, F., & Bergman, A. (1975). *The psychological birth of the human infant.* New York: Basic Books.

Malatesta, C.Z., Culver, C., Tesman, J.R., & Shepard, B. (1989). The development of emotion expression during the first two years of life. *Monographs of the Society for Research in Child Development, 54,* (1-2, Serial No. 219).

Mumme, D.L., Fernald, A., & Herrara, C. (1996). Infant's responses to Facial and Vocal Emotional Signals in a Social Referencing Paradigm. *Child Development, 67,* 3219-3237.

Mundy, P., Kasari, C., & Sigman, M. (1992). Non-verbal communication, affective sharing, and intersubjectivity. *Infant Behavior and Development, 15,* 377-381.

Mundy. P., Sigman, P., Ungerer, J., & Sherman, T. (1986). Defining the socila deficits in Autism: The contribution of non-verbal communication measures. *Journal of Child Psychology and Psychiatry and Allied Disciplines, 27,* 657-669.

Murray, L, & Trevarthen, C. (1985). Emotion regulation of interactions between 2-month-old infants and their mothers. In T. Field, & N. Fox, (Eds.), *Social Perception In Infants,* Norwood, NJ: Ablex, 137-154.

Murray, L. (1991). Intersubjectivity, object relations theory, and empirical evidence from infant-mother interactions. *Infant Mental Health Journal, 12,* 219-232.

Murray, L. (1992). The impact of postnatal depression on infant development.*Journal of Child Psychology and Psychiatry, 33,* 543-561.

Oster, H., & Ekman, P. (1977). Facial behavior in child development. In A. Collins (Ed.), *Minnesota Symposium on Child Psychology* (Vol. 11, 231-276). New York: Thomas A. Crowell.

Parke, R.D., (1992). Social Development in Infancy. In G.J. Suci and S.S. Robertson (Eds.). *Future Directions in Infant Development Research.* Springer: Verlag. (1 – 20).

Perry, B.D., Pollard, R.A., Blakley, T., Baker, W., & Vigilante, D. (1995). Childhood trauma, the neurobiology of adaptation and the "use-dependent" development of the brain: How "states" become "traits" *Infant Mental Health Journal, Vol 16, No. 4, 271-291.*

Piaget, J. (1954). *The Construction of Reality in the Child.* Translated by Margaret Cook. New York: Basic Books.

Prizant, B.M., & Wetherby, A.M. (1990a). Incorporating a socioemotional perspective in early communicative assessment. *Zero to Three, 11,* 1-12.

Rochat, P., & Striano, T. (1999b). Social cognitive development in the first year. In P Rochat (Ed.), *Infant Social Cognition* (3-34). Hillsdale, NJ: Erlbaum.

Rochat, P., Querido, J.G., & Striano, T. (1999). Emerging Sensitivity to the Timing and Structure of Protoconversation in Early Infancy. *Developmental Psychology, 35,* (4), 950-957.

Sameroff, A. J. & Feise, B.H. (1990). Transactional regulation and early intervention. In S.J. Meisels and J.P. Shonkoff (Eds.), *Handbook of early childhood intervention* (. 119 – 191). New York: Cambridge University Press.

Sameroff, A.J. (1993). Models of Development and Developmental Risk. In C.H. Zeanah, (Ed.). *Handbook of Infant Mental Health.* The Guilford Press: New York, (3 – 13).

Sameroff, A.J. (1993). Models of Development and Developmental Risk. In C.H. Zeanah Jr (Ed.), *Handbook of Infant Mental Health.* New York: The Guilford Press.

Sameroff, A.J., & Chandler, M.J. (1975). Reproductive risk and the continuum of caretaking causality. In F.D. Horowitz, E.M. Hetherington, S.Scarr-Salapatek, & G.Siegel (Eds.), *Review of Child Development Research,* (Vol. 4, 187-244). Chicago: University of Chicago.

Sameroff, A.J., & Emde, R.N. (1989). *Relationship Disturbances in Early Childhood.* New York: Basic Books.

Schore, A.N. (1996). The experience-dependent maturation of a regulatory system in the orbital prefrontal cortex and the origin of developmental psychopathology. *Development and Psychopathology, 8, 59-87.*

Shiller, V.M., Izard, C.E., & Hembree, E.A. (1986). Patterns of emotion expression during separation in the strange situation paradigm. *Developmental Psychology, 22,* 378-382.

Short, A.B. (1984). Short-term treatment outcomes using parents as co-therapists for their own autistic children. *Journal of Child Psychology and Psychiatry, 25,* (3), 443-458.

Sigman,M., Kasari, C., Kwon, J.H., & Yirmiya, N. (1992). Responses to the negative emotions of others by autistic, mentally retarded and normal children. *Child Development, 63,* 796-807.

Snow, M.E., Hertzig., M.E., & Shapiro, T. (1987). Expression of emotion in young autistic children. *Journal of the American Academy of Child and Adolescent Psychiatry, 26,* 836-838.

Sorce, J.F., Emde, R.N., Campos, J.J., & Klinnert, M.D. (1985). Maternal emotional signaling: Its effect on the visual cliff behavior of one-year olds. *Developmental Psychology, 20,* 195-200.

Spiker, D., Ferguson, J., & Brooks-Gunn, J. (1993). Enhancing Maternal Interactive Behavior and Child Social Competence in Low Birth Weight, Premature Infants. *Child Development, 64,* 754-768.

Stenberg, C.R., Campos, J.J., & Emde, R.N. (1983). The facial expressions of anger in seven-month-old infants. *Child Development, 54,* 178-184.

Stern, D.N. (1985). *The interpersonal world of the infant: A View from Psychoanalysis and developmental psychology.*New York : Basic Books.

Stern, D.N. (1995). *The motherhood constellation. A unified View of Parent-infant psychotherapy.* New York : Basic Books.

Stern, D.N. (1998). The Process of Therapeutic Change Involving Implicit Knowledge: Some Implications Of Developmental Observations For Adult Psychotherapy. *Infant Mental Health Journal, 19, (3),* 300-308.

Tardif, C., Plumet, M-H., Beaudichon, J., Waller, D., Bouvard, M., & Leboyer, M. (1995). Micro-analysis of Social Interactions between Autistic Children and Normal Adults in Semi-structured Play Situations. *International Journal of Behavioural Development, 18,* (4), 727-747.

Thelen, E. (1989). Self-Organization in Developmental Processes: Can Systems Approaches Work? In M.R. Gunnar and E. Thelen (Eds.), *Systems and Development: Minnesota Symposium on child Psychology, Vol. 22,* 77 – 94

Tomkins, S.S. (1963). *Affect, imagery, consciousness: Vol II The negative affects.* New York: Springer.

Trevarthen, C. (1980). The foundations of intersubjectivity: Development of interpersonal and cooperative understanding in infants. In D.R. Olson (Ed.), *The social foundations of language and thought* (1-34). New York: Norton.

Tronick, E. Z. (1980). The Primacy of Social Skills in Infancy. In D. Sawin, R. Hawkins, L. Walker, & J. Penticuff (Eds.), *Exceptional Infant, Vol.4,* (144-158). New York: Bruner/Mazel.

Tronick, E.Z. (1989). Emotions and emotional communication in infants. *American Psychologist, 44,*112-119.

Tronick, E.Z. (1998). Dyadically Expanded States of Consciousness and the Process of Therapeutic Change. *Infant Mental Health Journal, 19, (3),* 290-299.

Tronick, E.Z., Als, H., Adamson, L., Wise, S., & Brazelton, T.B. (1978). The infants response to entrapment between contradictory messages in face to face interaction. *Journal of the American Academy of Child Psychiatry, 17,* 1-13.

Walden, T., & Knieps, L. (1996). Reading and Responding to Social Signals. In M. Lewis and M.W. Sullivan (Eds.), *Emotional Development in Atypical Children.* NJ: Lawrence Erlbaum Assoc.

Walden, T.A., & Ogan, T.A. (1988). The development of social referencing. *Child Development,59,* 1230-1240.

Weinberg, M.K., Tronick E.Z., Cohn, J.F., & Olson, K.L. (1999). Gender Differences in Emotional Expressivity and Self-Regulation During Early Infancy. *Developmental Psychology, 35, 1,* 175-188.

Yirmiya, N., Sigman, M., Kasari, C., & Mundy, P. (1989). Facial expressions of affect in autistic, mentally retarded and normal children. *Journal of Child Psychology and Psychiatry, 30,* 725-735.

Zeanah, C.H., Mammen, O.K., & Lieberman, A.F. (1993). Disorders of Attachment. In C.H. Zeanah (Ed.). *Handbook of Infant Mental Health.* The Guilford Press: New York, (332-349).

Appendix A

Operational Definition of Moments of Meeting (MOM) and Moving Along Moments (MA).

Moments of Meeting are operationally defined as:

An occasion where the socially responsive and primary interactive behaviours of both interactants catalyse the establishment of a new instance of mutual engagement. Mutual recognition of the interactive moment becomes the vehicle to guide and direct the dyad toward a new goal and way-of-being-with-the-other. Critical features include mutual gaze (eye contact), vocalisations, physical proximity, approach behaviours, gestures (including all forms of touch).

Moving Along Moments are operationally defined as:

An occasion where both interactants engage for the purpose of clarifying, affirming or monitoring the goal during a period of Moving Along. No uniquely configured behaviours are elicited from either partner, but rather are part of the action tendencies that have preceded the moment. The most defining feature of this moment is mutual gaze, but may be accompanied by vocalisations, physical proximity, gesture (all forms of touch) or approach behaviours.

Appendix B

Masters Thesis: Averil Worner.
Actual data coding (Start – 27.27)
Video – Dyad B - Tape

Mom. no.	MOM/MA Start Time	MOM/MA End Time	Comments: including antecedents, consequences, brief description of observable behaviours, defining behaviours from definition given.
			Sample

Appendix C

Behavioural definitions of behaviours used for coding (within each MOM and MA).

Category	Description of Terms
	Dyadic behaviours
Mutual gaze	Instances of mutual gazing between both interactants.
Physical contact	Occurrences of all touch responses eg cuddle, hug, mutual kiss.
Mutual smiling	Instances of sustained smiling by both partners accompanied by mutual eye contact.
Affect Match	Examples where the child and mother's facial expressions are matched using a positive/negative dichotomy.
	Child Behaviours
Response to questions or statements	An example of any behavioural display, which is an immediate response to a question or statement made by the mother.
Imitation response	Instances of verbal/motor matching of mother's behaviour.
Physical contact	Occurrences of touch responses toward mother independent of the mother's touch responses eg hand/foot on mother's arm, leg, hair etc.
Cooperative play initiator	Any example where a toy/object of interest is offered to the mother for use in play.
Vocalisation or verbalisation	Any vocal or verbal utterance observed during the MOM/MA.
Anticipatory gesture	Instance of reaching in response to the behaviour of the mother eg hands up, arms spread out.
Smiling initiator	Where the child smiles first while maintaining eye contact with the mother.
Approach behaviour	Where the child makes a physical approach toward the mother during the MOM eg leaning forward, coming from another part of the room.

Mother Behaviour

Question or statement starter	Any occasion when the mother makes a statement eg "Here's the blanket", "A bubble", or asks a question eg "Do you want more?", "Where are your shoes?"
Affirmation response	Any verbal utterance or non-verbal gesture that is affirming/disconfirming of the child's behaviour eg "Well done", "Good Boy", nod or shake of the head.
Imitation response	Instances of verbal/motor matching of the child's behaviour.
Physical contact	Occurrences of touch responses toward the child independent of the child's touch responses eg hand on arm, leg, hair etc.
Cooperative play initiator	Any example where a toy/object of interest are offered to the child for use in play.
Anticipatory gesture	Example of reaching in response to the behaviour of the child. Includes arms up, hands out, head cocked to one side.
Smiling initiator	Where the mother smiles first while maintaining eye contact with the child.
Approach Behaviour	Where the mother makes a physical approach toward the child during the MOM eg leaning forward, coming from another part of the room.

Appendix D

Descriptive statistics table relating Means and Standard Deviations of each moment type across sessions for all dyads.

Descriptive Statistics
Dependent Variable: DURATION

DYAD	SESSION	TYPE	Mean	Std. Deviation	N
1.00	1.00	MOM	21.7500	11.2853	8
		Total	21.7500	11.2853	8
	2.00	MOM	63.6000	28.3165	10
		MA	12.0000	.	1
		Total	58.9091	31.0434	11
	3.00	MOM	87.5000	82.7807	12
		MA	70.5000	28.9914	2
		Total	85.0714	76.8189	14
	4.00	MOM	92.9091	77.5067	11
		Total	92.9091	77.5067	11
	5.00	MOM	290.5000	234.5807	14
		MA	28.2857	10.1113	7
		Total	203.0952	227.6886	21
	Total	MOM	126.3455	160.6397	55
		MA	35.1000	23.1394	10
		Total	112.3077	151.4897	65
2.00	1.00	MOM	20.8333	9.6468	12
		MA	11.3333	3.2146	3
		Total	18.9333	9.4903	15
	2.00	MOM	18.8000	8.8794	10
		MA	9.5556	4.4472	9
		Total	14.4211	8.4084	19
	3.00	MOM	44.5455	30.9624	11
		MA	11.1250	2.4165	8
		Total	30.4737	28.6751	19
	4.00	MOM	62.2632	33.7175	19
		MA	18.2500	6.1847	4
		Total	54.6087	35.0191	23
	5.00	MOM	79.5000	39.3677	28
		MA	19.9091	8.8821	11
		Total	62.6923	43.1272	39
	6.00	MOM	126.0625	66.6128	16
		MA	20.1429	11.5676	7
		Total	93.8261	74.4658	23
	Total	MOM	66.1875	51.8190	96
		MA	15.2857	8.3265	42
		Total	50.6957	49.3490	138
3.00	1.00	MOM	15.0000	5.1962	3
		MA	19.8000	4.8683	5
		Total	18.0000	5.2372	8
	2.00	MOM	21.0000	10.9848	7
		MA	14.5000	5.2599	4
		Total	18.6364	9.5632	11
	3.00	MOM	21.3846	6.3710	13

		MA	15.1818	4.8129	11
		Total	18.5417	6.4199	24
	4.00	MOM	33.2000	18.3836	10
		MA	13.2500	6.1847	4
		Total	27.5000	18.1733	14
	5.00	MOM	48.5278	34.3515	36
		MA	12.8000	3.2931	10
		Total	40.7609	33.7930	46
	Total	MOM	36.9420	28.9395	69
		MA	14.8529	4.9183	34
		Total	29.6505	25.9829	103
4.00	1.00	MOM	43.0000	52.4976	7
		MA	6.0000	1.4142	2
		Total	34.7778	48.3057	9
	2.00	MOM	45.5000	24.4870	10
		MA	11.0000	4.5826	3
		Total	37.5385	26.1171	13
	3.00	MOM	59.2727	29.5976	11
		MA	23.0000	13.0000	3
		Total	51.5000	30.6337	14
	4.00	MOM	74.2500	49.4506	8
		MA	17.3333	4.0415	3
		Total	58.7273	49.2120	11
	5.00	MOM	101.5882	60.9683	17
		MA	20.5000	4.9497	2
		Total	93.0526	62.9219	19
	6.00	MOM	130.9375	72.6897	16
		MA	34.7500	7.0887	4
		Total	111.7000	75.7469	20
	Total	MOM	84.4058	61.9671	69
		MA	20.3529	11.5701	17
		Total	71.7442	61.2820	86
5.00	1.00	MOM	22.2000	5.1186	5
		MA	14.7500	1.5000	4
		Total	18.8889	5.4186	9
	2.00	MOM	46.4286	30.3472	7
	2.00	MOM	46.4286	30.3472	7
		MA	12.6667	1.5275	3
		Total	36.3000	29.6725	10
	3.00	MOM	58.0000	32.0208	13
		MA	16.6667	14.5694	6
		Total	44.9474	33.6476	19
	4.00	MOM	65.8182	29.7349	11
		MA	21.5556	9.1257	9
		Total	45.9000	31.7936	20
	5.00	MOM	80.1667	51.8405	18
		MA	14.5556	6.7103	9
		Total	58.2963	52.5780	27
	6.00	MOM	91.7647	125.0030	34
		MA	17.1500	5.3042	20
		Total	64.1296	105.1766	54
	Total	MOM	73.6023	84.5757	88
		MA	16.9608	7.6836	51
		Total	52.8201	72.6743	139
6.00	1.00	MOM	18.1250	6.3118	8
		Total	18.1250	6.3118	8

		MA	11.0000	.	1
		Total	27.7778	9.5888	9
	3.00	MOM	36.9000	23.3212	10
		MA	10.0000	.	1
		Total	34.4545	23.5642	11
	4.00	MOM	65.2000	23.2637	5
		MA	9.5000	3.5355	2
		Total	49.2857	33.1899	7
	5.00	MOM	68.6923	27.9237	13
		MA	13.1667	3.7639	6
		Total	51.1579	35.0274	19
	Total	MOM	44.8182	28.4133	44
		MA	11.9000	3.4785	10
		Total	38.7222	28.6991	54
Total	1.00	MOM	23.8605	22.9446	43
		MA	14.5714	5.8140	14
		Total	21.5789	20.4686	57
	2.00	MOM	38.2692	25.7584	52
		MA	11.3333	4.2583	21
		Total	30.5205	25.0151	73
	3.00	MOM	51.3286	45.4653	70
		MA	18.5806	16.9603	31
		Total	41.2772	41.7493	101
	4.00	MOM	65.3281	45.6366	64
		MA	17.7727	7.8372	22
		Total	53.1628	44.6589	86
	5.00	MOM	96.0556	111.2166	126
		MA	17.6889	8.6098	45
		Total	75.4327	101.5480	171
	6.00	MOM	109.5758	102.5747	66
		MA	20.0968	9.1664	31
		Total	80.9794	94.3896	97
	Total	MOM	71.5558	83.3442	421
		MA	17.2439	10.4089	164
		Total	56.3299	74.9798	585

Appendix E

Tests of Between-Subjects Effects

Dependent Variable: DURATION

Source		Type III Sum of Squares	df	Mean Square	F	Sig.
Intercept	Hypothesis	431625.537	1	431625.537	2.582	.355
	Error	166771.224	.998	167183.646		
DYAD	Hypothesis	39312.992	5	7862.598	1.144	.445
	Error	33719.602	4.906	6872.476		
SESSION	Hypothesis	131604.418	5	26320.884	1.471	.343
	Error	87924.571	4.913	17897.575		
TYPE	Hypothesis	158556.118	1	158556.118	9.657	.018
	Error	110972.596	6.759	16418.911		
DYAD * SESSION	Hypothesis	117642.798	22	5347.400	1.508	.195
	Error	60395.253	17.030	3546.334		
DYAD * TYPE	Hypothesis	34063.276	5	6812.655	1.923	.121
	Error	103946.814	29.339	3542.942		
SESSION * TYPE	Hypothesis	86417.163	5	17283.433	4.877	.003
	Error	85748.051	24.195	3544.044		
DYAD * SESSION * TYPE	Hypothesis	67365.981	19	3545.578	1.004	.455
	Error	1843797.788	522	3532.180		

Appendix F1

Number of behaviours recorded within each MOM/MA in sessions 1, 3, and 5
DYAD 1

	Session Number					
	1		3		5	
Category	Dyadic Behaviour					
Mutual gaze	8		11		21	
Physical contact	2		8		5	
Mutual smiling	0		3		10	
Affect match	0		4		9	
Totals	**10**		**27**		**48**	
	Child Behaviour					
Response to ?/st	0		0		7	
Imitation resp.	0		1		1	
Physical contact	0		4		14	
Coop play init.	0		0		1	
Vocal/Verbal	0		1		7	
Anticip. Gest	3		5		7	
Smiling initiator	2		1		9	
Approach Beha	2		3		2	
Totals	**7**		**15**		**48**	
	Mother Behaviour					
Question/State	1		0		12	
Affirmation R	0		1		6	
Imitation resp	0		1		2	
Physical contact	1		4		5	
Coop play init	0		0		2	
Anticipatory ges	2		5		5	
Smiling initiator	1		3		4	
Approach behav	0		0		2	
Totals	**5**		**14**		**38**	

Appendix F2

Number of behaviours recorded within each MOM/MA in sessions 1, 3, and 5
DYAD 2

	Session Number					
	1		3		5	
Category	Dyadic Behaviour					
Mutual gaze	15		19		39	
Physical contact	3		5		12	
Mutual smiling	4		5		12	
Affect match	4		6		15	
Totals	**26**		**35**		**78**	
	Child Behaviour					
Response to ?/st	3		6		7	
Imitation resp.	0		1		3	
Physical contact	1		4		11	
Coop play init.	0		0		1	
Vocal/Verbal	5		6		11	
Anticip. Gest	2		5		10	
Smiling initiator	4		2		4	
Approach Beha	0		4		8	
Totals	**15**		**28**		**55**	
	Mother Behaviour					
Question/State	8		11		16	
Affirmation R	3		8		5	
Imitation resp	0		2		3	
Physical contact	6		5		14	
Coop play init	0		0		1	
Anticipatory ges	2		1		5	
Smiling initiator	1		7		4	
Approach behav	0		5		1	
Totals	**20**		**39**		**49**	

Appendix F3

Number of behaviours recorded within each MOM/MA in sessions 1, 3, and 5
DYAD 3

	Session Number					
	1		3		5	
Category	Dyadic Behaviour					
Mutual gaze	8		24		46	
Physical contact	3		3		4	
Mutual smiling	2		5		11	
Affect match	0		4		13	
Totals	**13**		**36**		**74**	
	Child Behaviour					
Response to ?/st	4		6		4	
Imitation resp.	0		0		1	
Physical contact	0		3		5	
Coop play init.	0		1		8	
Vocal/Verbal	2		6		4	
Anticip. Gest	1		3		7	
Smiling initiator	0		2		4	
Approach Beha	0		3		8	
Totals	**7**		**24**		**41**	
	Mother Behaviour					
Question/State	5		9		13	
Affirmation R	3		4		7	
Imitation resp	0		1		3	
Physical contact	1		1		0	
Coop play init	1		2		3	
Anticipatory ges	5		7		10	
Smiling initiator	3		2		4	
Approach behav	6		6		7	
Totals	**24**		**32**		**47**	

Appendix F4

Number of behaviours recorded within each MOM/MA in sessions 1, 3, and 5
DYAD 4

	Session Number					
	1		3		5	
Category	Dyadic Behaviour					
Mutual gaze	9		14		19	
Physical contact	4		6		6	
Mutual smiling	1		6		8	
Affect match	1		8		11	
Totals	**15**		**24**		**44**	
	Child Behaviour					
Response to ?/st	2		3		5	
Imitation resp.	1		1		2	
Physical contact	5		11		4	
Coop play init.	2		2		1	
Vocal/Verbal	1		10		8	
Anticip. Gest	3		4		3	
Smiling initiator	0		5		3	
Approach Beha	2		3		4	
Totals	**17**		**39**		**30**	
	Mother Behaviour					
Question/State	5		11		12	
Affirmation R	4		6		6	
Imitation resp	1		2		2	
Physical contact	4		3		7	
Coop play init	1		2		2	
Anticipatory ges	2		5		4	
Smiling initiator	1		4		5	
Approach behav	2		2		1	
Totals	**20**		**35**		**39**	

Appendix F5

Number of behaviours recorded within each MOM/MA in sessions 1, 3, and 5
DYAD 5

	Session Number					
	1		3		5	
Category	Dyadic Behaviour					
Mutual gaze	9		19		27	
Physical contact	0		7		4	
Mutual smiling	1		6		6	
Affect match	2		7		6	
Totals	**12**		**39**		**43**	
	Child Behaviour					
Response to ?/st	0		1		3	
Imitation resp.	0		0		1	
Physical contact	0		6		5	
Coop play init.	0		0		4	
Vocal/Verbal	2		5		1	
Anticip. Gest	1		2		3	
Smiling initiator	0		1		2	
Approach Beha	3		5		5	
Totals	**6**		**20**		**24**	
	Mother Behaviour					
Question/State	1		7		7	
Affirmation R	0		4		5	
Imitation resp	0		1		0	
Physical contact	0		7		2	
Coop play init	1		0		5	
Anticipatory ges	2		4		7	
Smiling initiator	3		6		6	
Approach behav	0		2		4	
Totals	**7**		**31**		36	

Appendix F6

Number of behaviours recorded within each MOM/MA in sessions 1, 3, and 5
DYAD 6

	Session Number					
	1		3		5	
Category	Dyadic Behaviour					
Mutual gaze	8		11		19	
Physical contact	3		3		6	
Mutual smiling	3		6		4	
Affect match	1		6		5	
Totals	**15**		**26**		**34**	
	Child Behaviour					
Response to ?/st	0		1		3	
Imitation resp.	0		0		0	
Physical contact	3		0		2	
Coop play init.	1		3		0	
Vocal/Verbal	0		7		6	
Anticip. Gest	2		3		2	
Smiling initiator	0		1		2	
Approach Beha	5		1		5	
Totals	**11**		**16**		**20**	
	Mother Behaviour					
Question/State	7		7		13	
Affirmation R	4		6		11	
Imitation resp	0		4		2	
Physical contact	2		6		9	
Coop play init	0		4		1	
Anticipatory ges	5		6		4	
Smiling initiator	5		5		1	
Approach behav	2		5		6	
Totals	**25**		**43**		**47**	